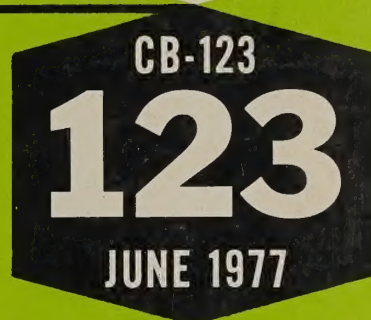


SAMS **PHOTOFACT[®]**

CB RADIO SERIES



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\$3.95

\$4.95 IN CANADA

Cat. No. CB-123

SAMS PHOTOFACT[®]

CB RADIO SERIES

VOLUME

123

by the

Howard W. Sams ENGINEERING STAFF



HOWARD W. SAMS & CO., INC.

INDIANAPOLIS, INDIANA

**FIRST EDITION
FIRST PRINTING — JUNE 1977**

C B RADIO SERIES VOLUME 123

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Library of Congress Catalog Card Number: 61-18464



NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

C B RADIO SERIES

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CHANNEL FREQUENCIES

FREQUENCY	CHANNEL	FREQUENCY	CHANNEL
26.965 MHz	1	27.215 MHz	21
26.975 MHz	2	27.225 MHz	22
26.985 MHz	3	27.235 MHz	24
27.005 MHz	4	27.245 MHz	25
27.015 MHz	5	27.255 MHz	23
27.025 MHz	6	27.265 MHz	26
27.035 MHz	7	27.275 MHz	27
27.055 MHz	8	27.285 MHz	28
27.065 MHz	9	27.295 MHz	29
27.075 MHz	10	27.305 MHz	30
27.085 MHz	11	27.315 MHz	31
27.105 MHz	12	27.325 MHz	32
27.115 MHz	13	27.335 MHz	33
27.125 MHz	14	27.345 MHz	34
27.135 MHz	15	27.355 MHz	35
27.155 MHz	16	27.365 MHz	36
27.165 MHz	17	27.375 MHz	37
27.175 MHz	18	27.385 MHz	38
27.185 MHz	19	27.395 MHz	39
27.205 MHz	20	27.405 MHz	40



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL 29XLR

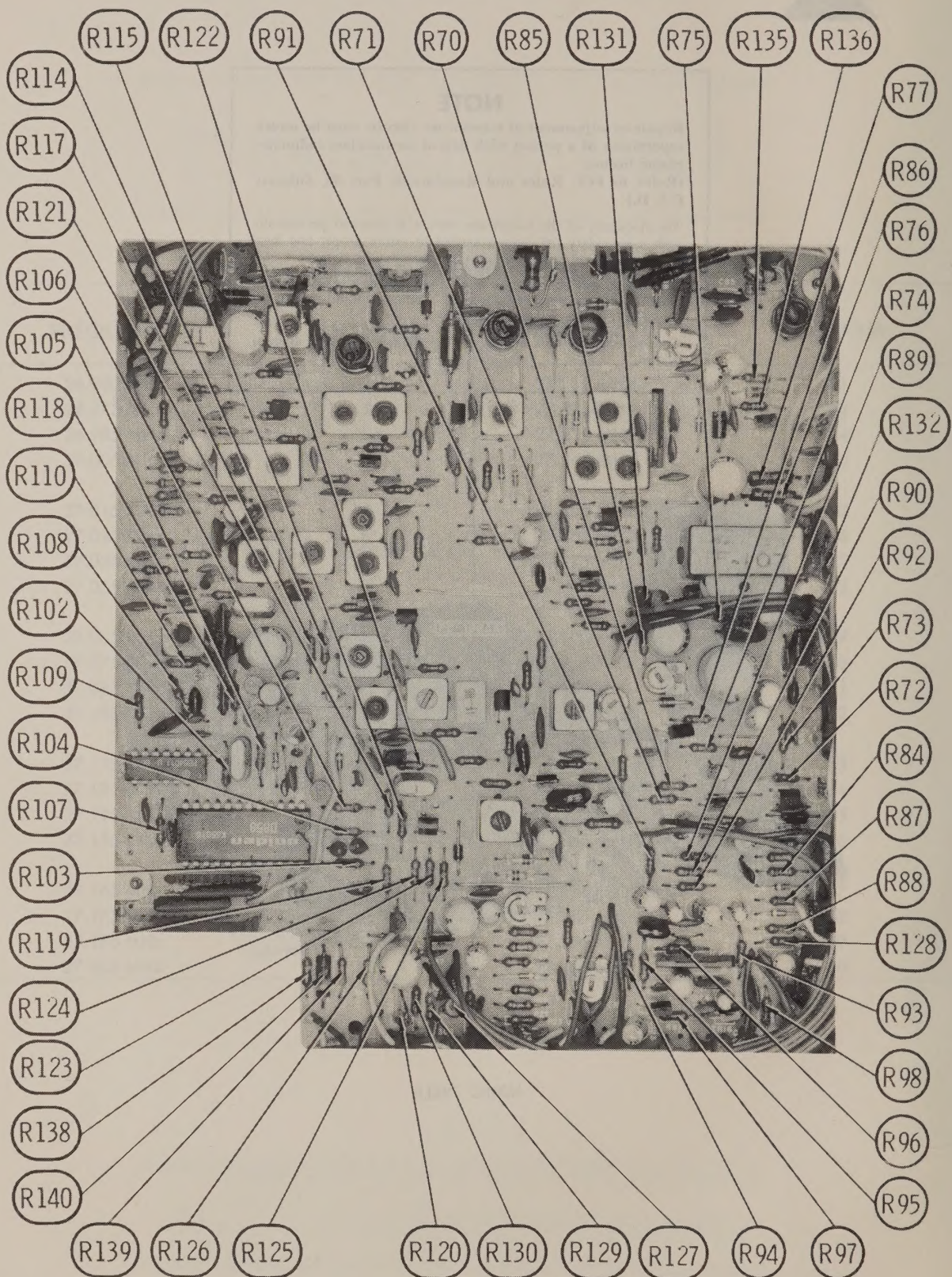
COBRA MODEL 29XLR

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

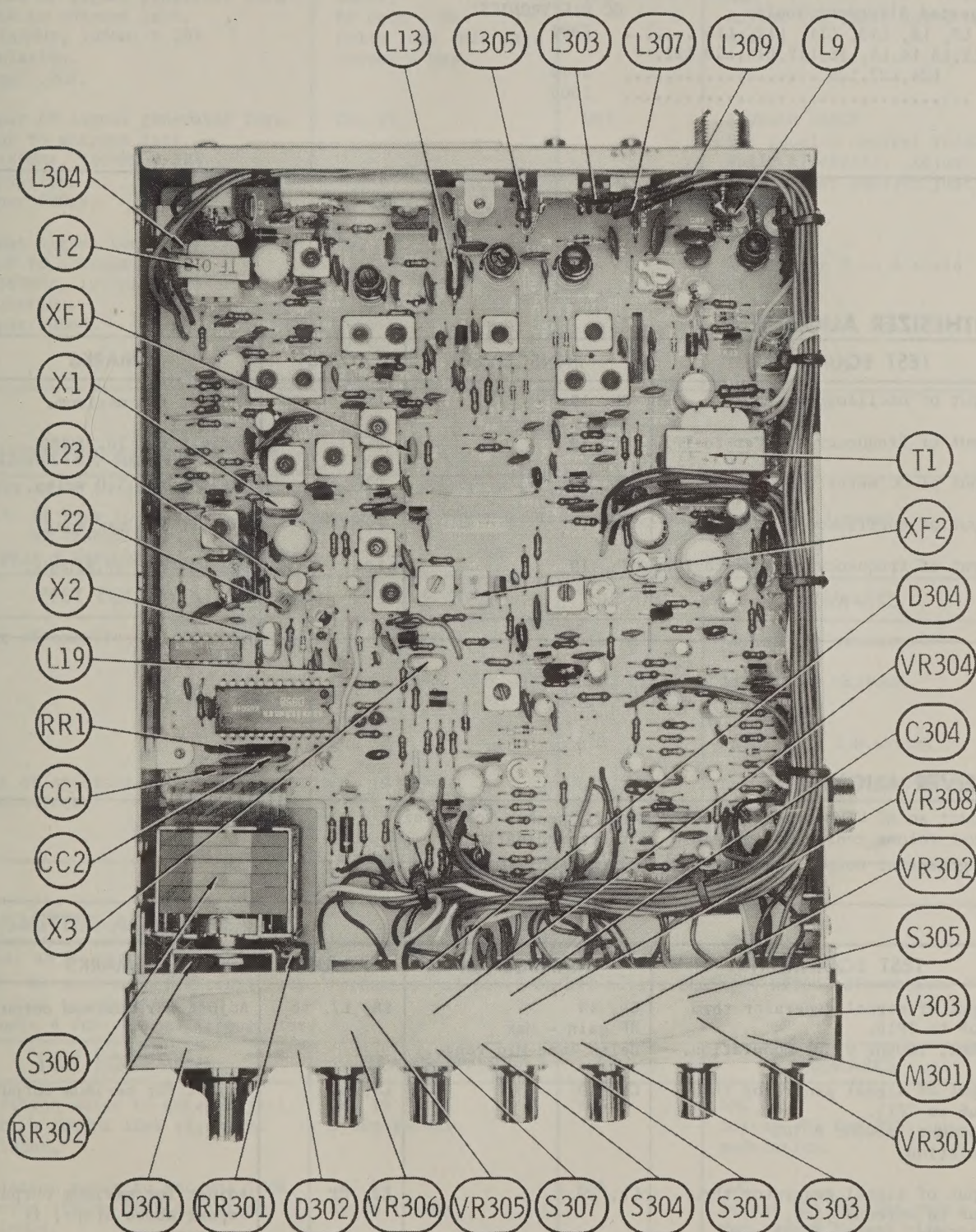
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7CE524



MAIN BOARD



CHASSIS-BOTTOM

ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period. Adjustments made with 13.8-volt DC input. Connect low sides of test equipment to ground unless specified otherwise. Connect a 50-ohm dummy load or antenna before keying transmitter. Suggested Alignment Tools: GC ELECTRONICS:
 L6, L7, L8, L10, L11, L12, L15 5009
 L1, L2, L3, L4, L5, L16, L17, L18, L20, L21, L24, L27, L28 9440
 VC1 5000

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of oscilloscope to TP1.	Ch. 19	L5	Adjust for maximum.
Input of frequency counter to TP1.	Ch. 19	VC1	Adjust for 10.240MHz.
Input of DC meter to TP5.	Ch. 19	L20	Adjust for 3.0 volts.
Input of oscilloscope to TP6.	Ch. 19	L21	Adjust for maximum.
Input of frequency counter to TP6.	Ch. 19	L24	Adjust for 37.880MHz.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication. Set generator output low enough to prevent AGC limiting.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP10. 455kHz, 1000Hz @ 30% modulation.	Ch. 19 RF gain - Max Delta Tune-Mid range.	L8, L7, L6	Adjust for maximum output.
Output of signal generator thru .01uF to TP11. 10.695MHz, 1000Hz @ 30% modulation.	Ch. 19	L4, L3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation.	Ch. 19.	L2, L1	Adjust for maximum output. Repeat above steps, if necessary.
Output of signal generator thru .01uF to antenna jack. 23.5MHz unmodulated. Input of RF VTVM to TP7.	Ch. 19	L28, L27	Adjust for maximum.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output .9uV.	Ch.19, RF Gain - Max Delta Tune -Midrange Volume - Max	VR2	AGC Adjust VR2 for 2 volts audio.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 500uV.	Ch. 19	VR3	SQUELCH RANGE Set squelch control VR302 fully clockwise. Adjust VR3 so that squelch just breaks.
Output signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 19	VR1	S METER Adjust for 9 on S scale of meter.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.

See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of oscilloscope to TP3.	Ch. 19	L18, L17	Adjust for maximum.
	Ch. 19	L16, L15, L12, L11	Adjust for maximum.
	Ch. 19	L12	Adjust for 3.8 watts.
Input of spectrum analyzer to antenna jack.	Ch. 19	L10	Adjust for MINIMUM at 54MHz.

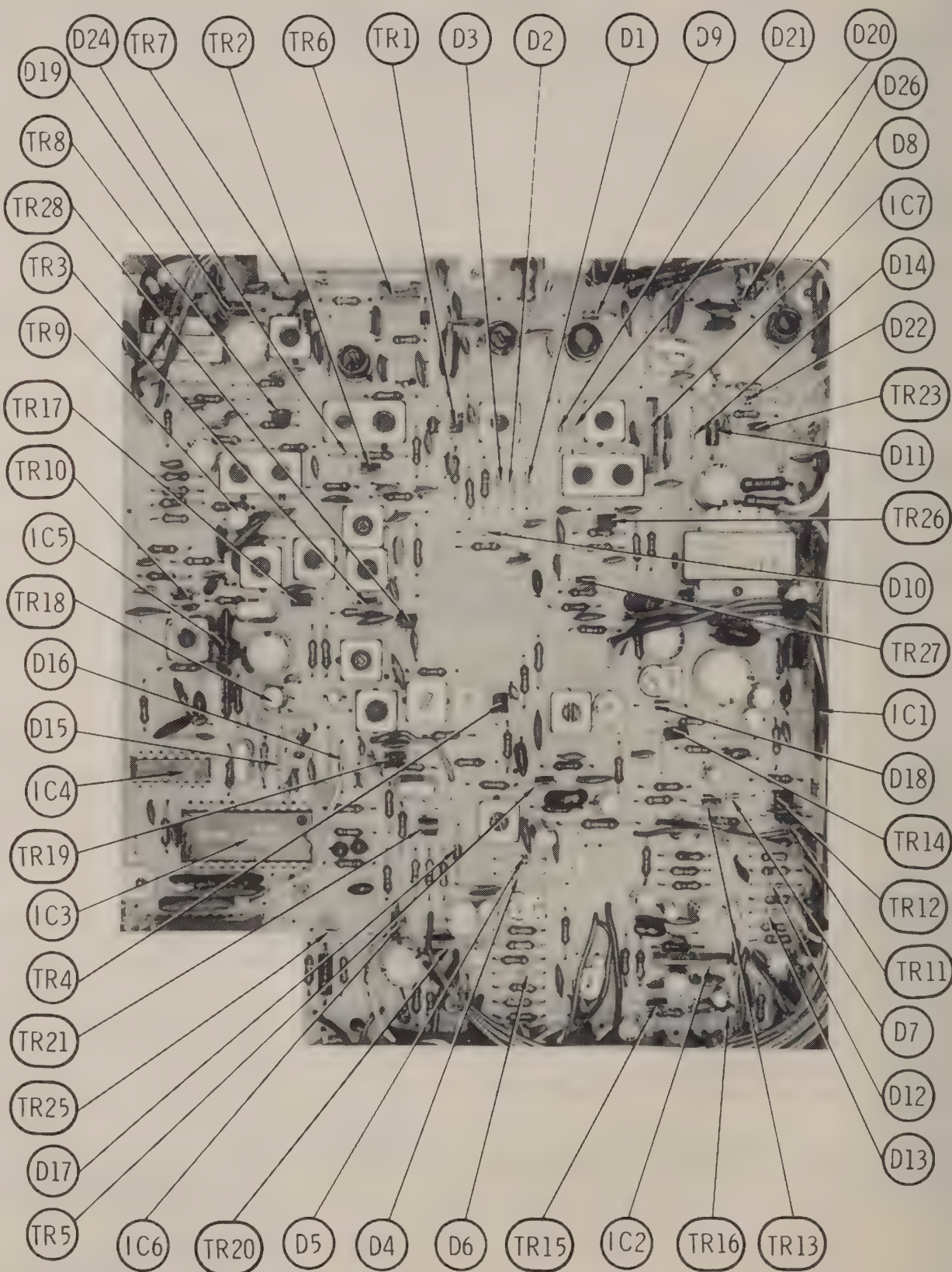
TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

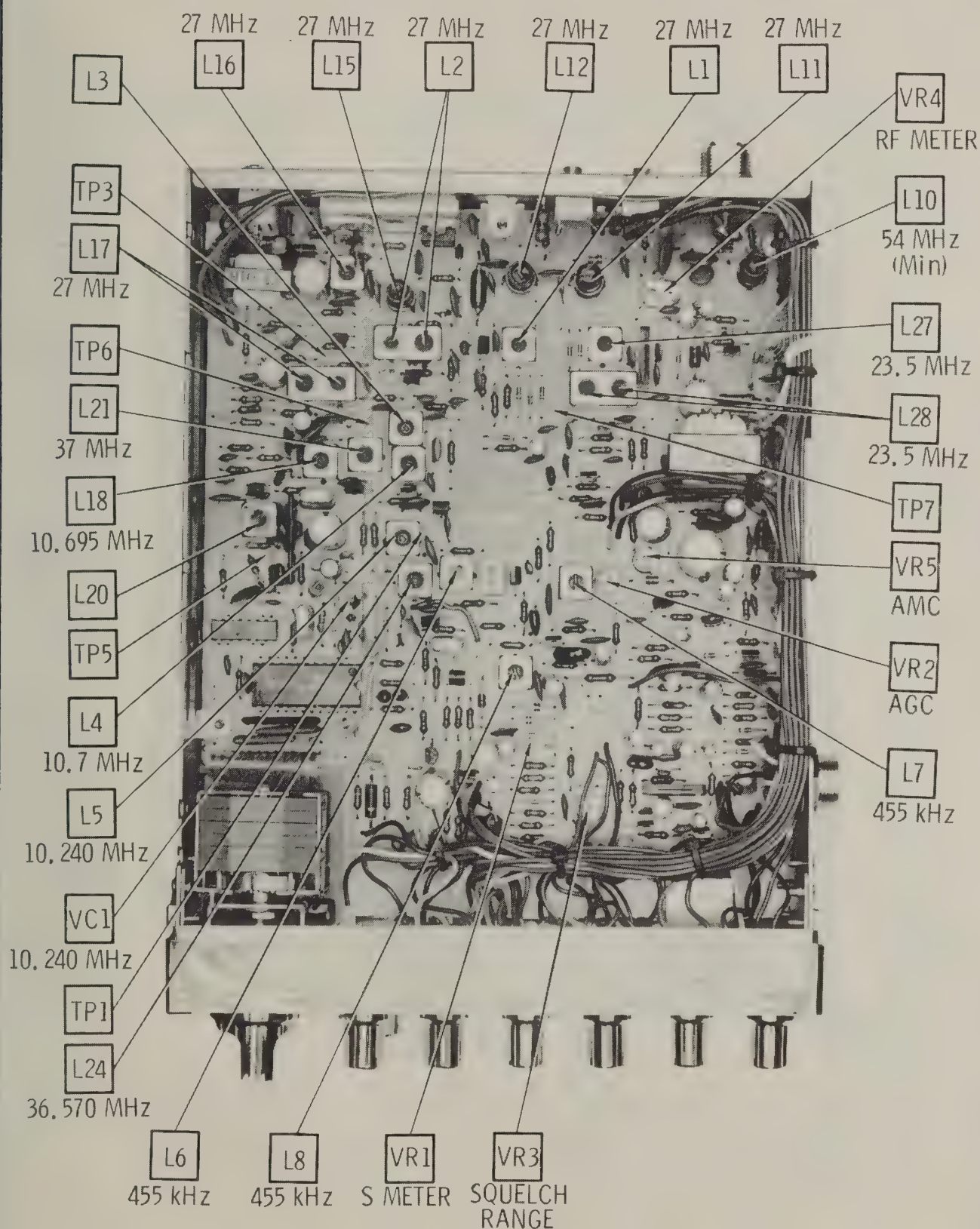
NOTE: Be sure to check transmitter frequency and power on all active channels after adjustments of transmitter.

See page 4 for channel frequencies.

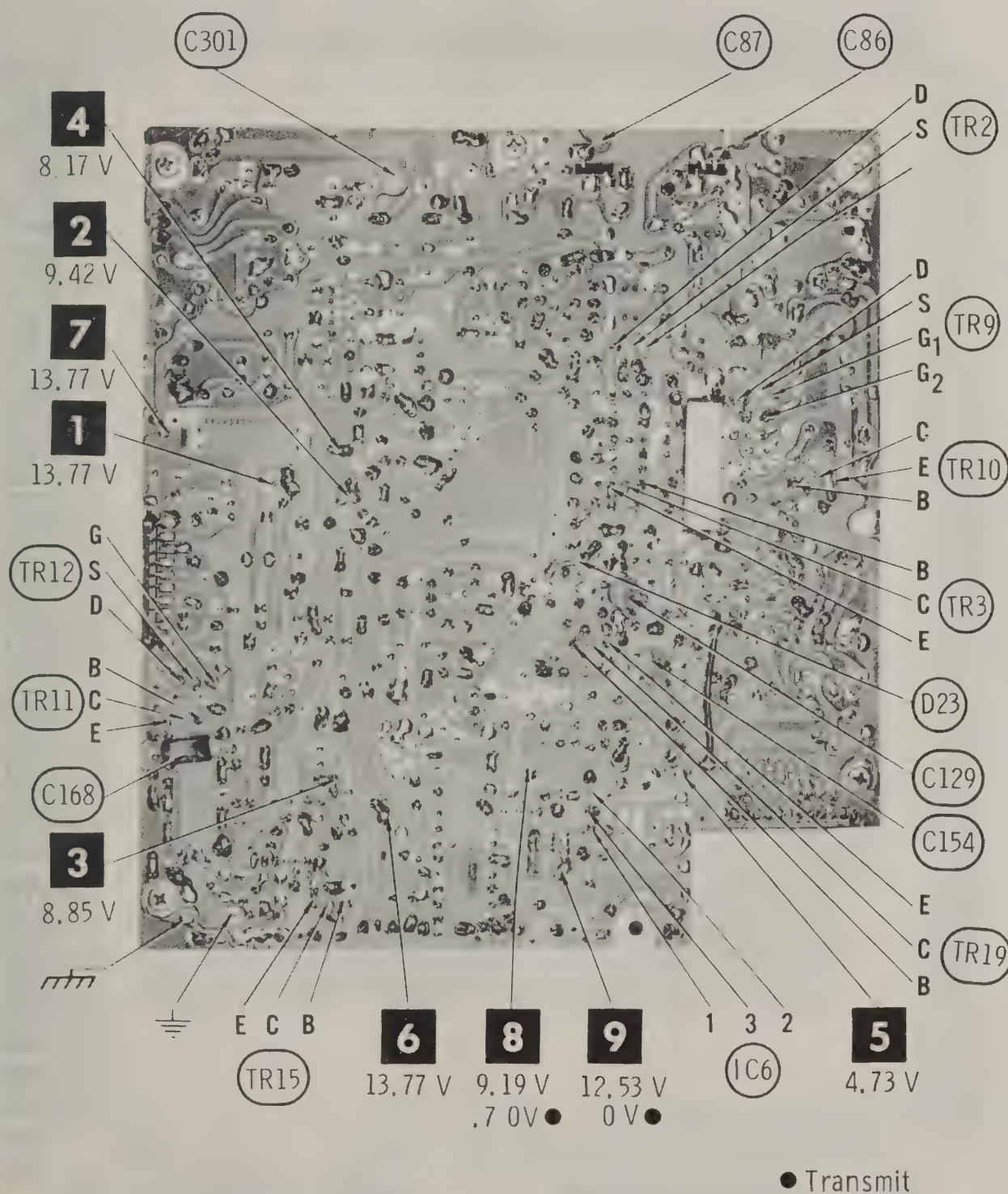
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Modulation meter to antenna jack. Inject a 1000Hz 10mV signal at Mic input.	Ch. 19 Dynamike-Max.	VR5	AMC Adjust VR5 for 95% modulation.
Modulation meter to antenna jack. Inject a 1000Hz 10mV signal at Mic input.	Ch. 19 Dynamike-Max.	VR6	MOD Adjust VR6 so that panel Mod. meter agrees with external modulation meter.
	Ch. 19	VR4	RF PANEL METER Adjust VR4 so that RF panel meter agrees with RF wattmeter.



MAIN BOARD

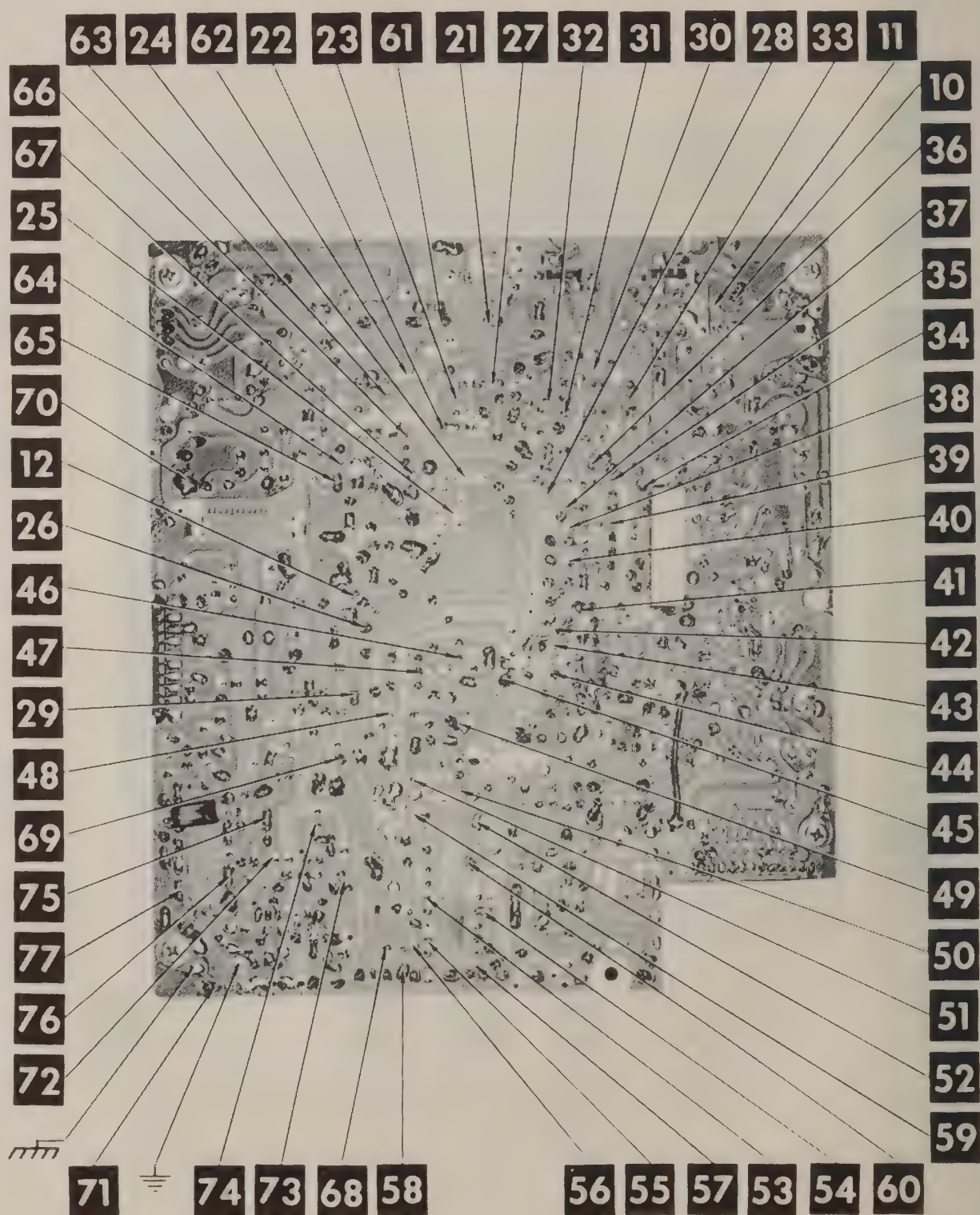


CHASSIS-BOTTOM

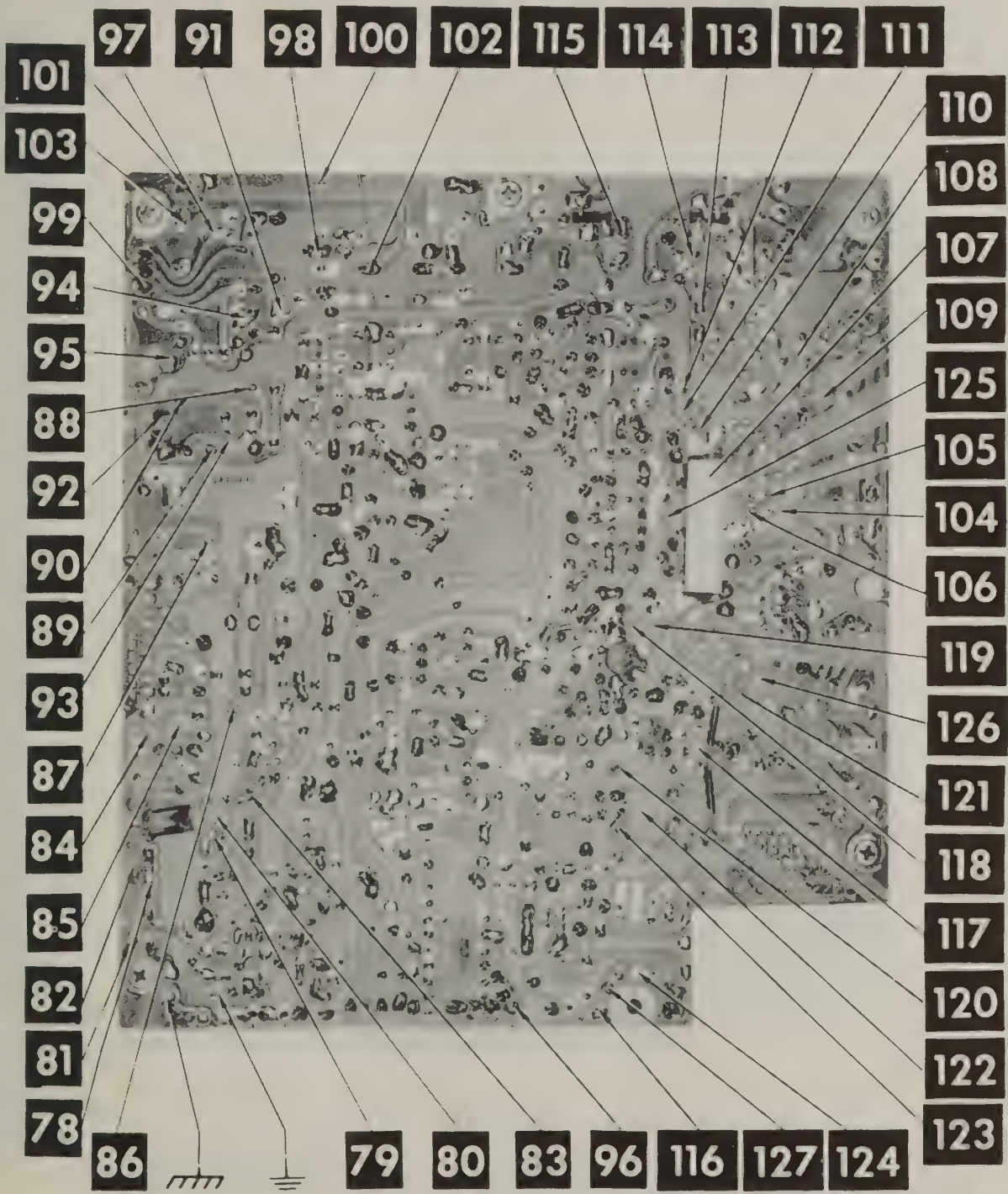


COBRA MODEL 29XLR

MAIN BOARD

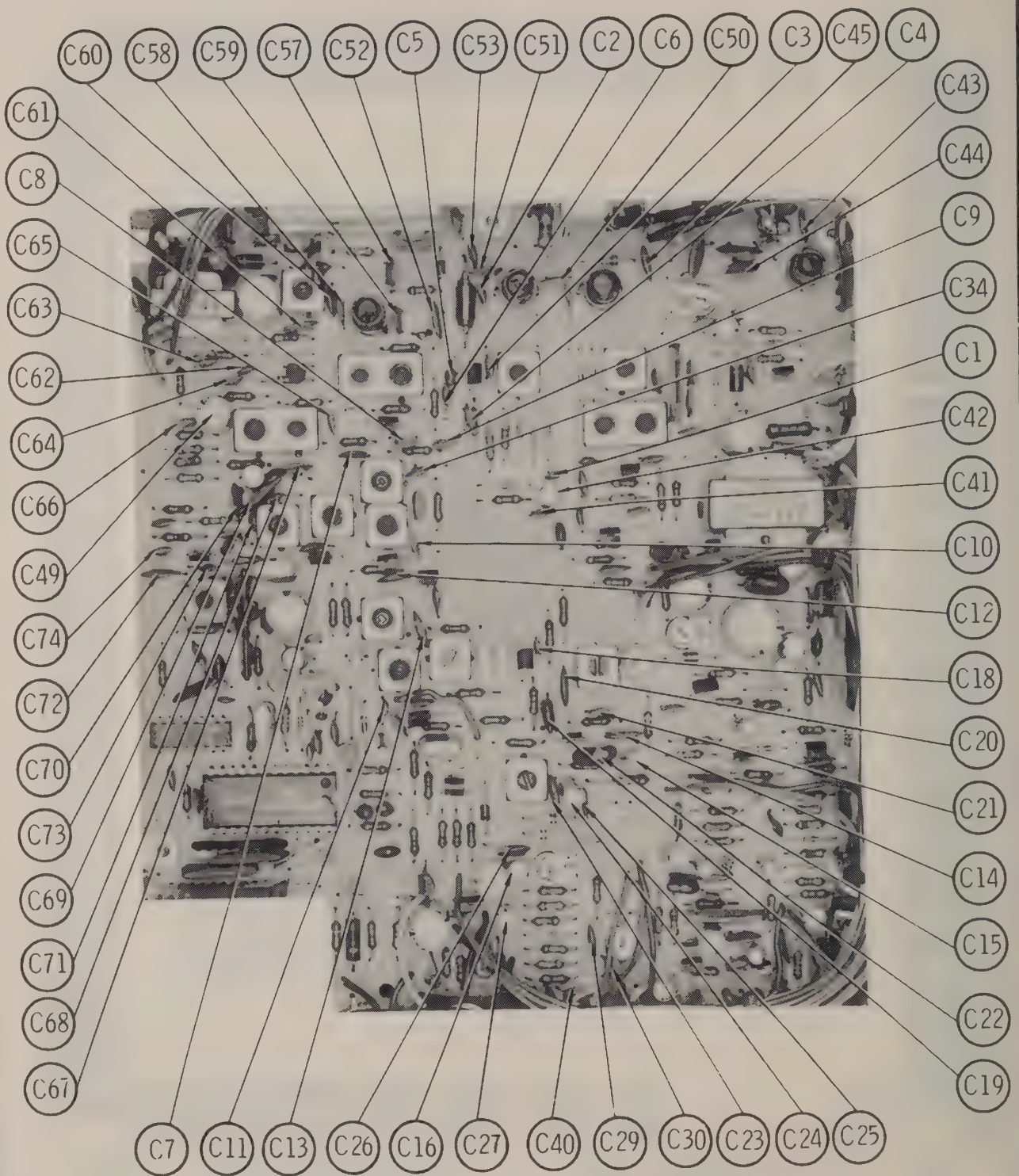


MAIN BOARD

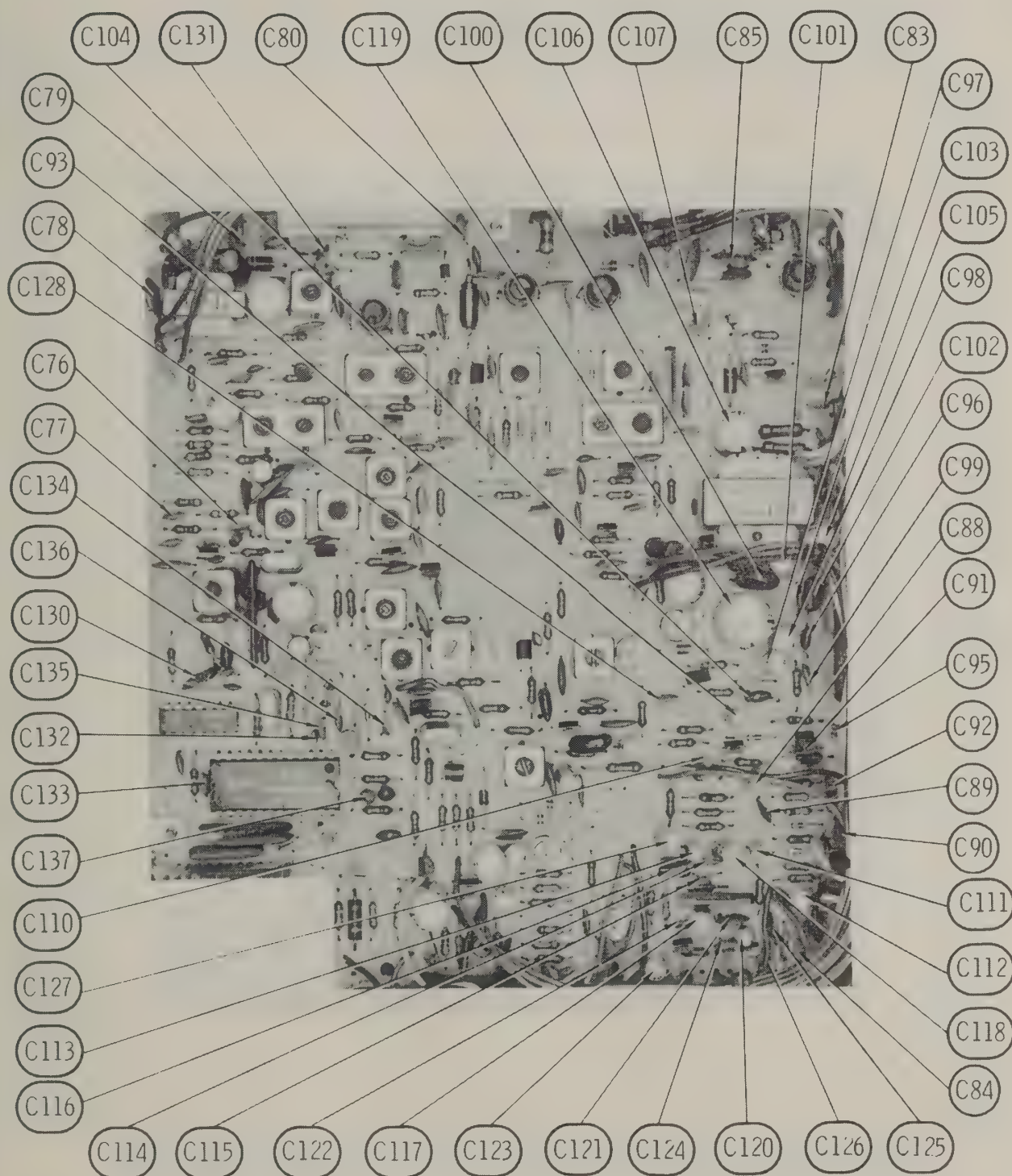


COBRA MODEL 29XLR

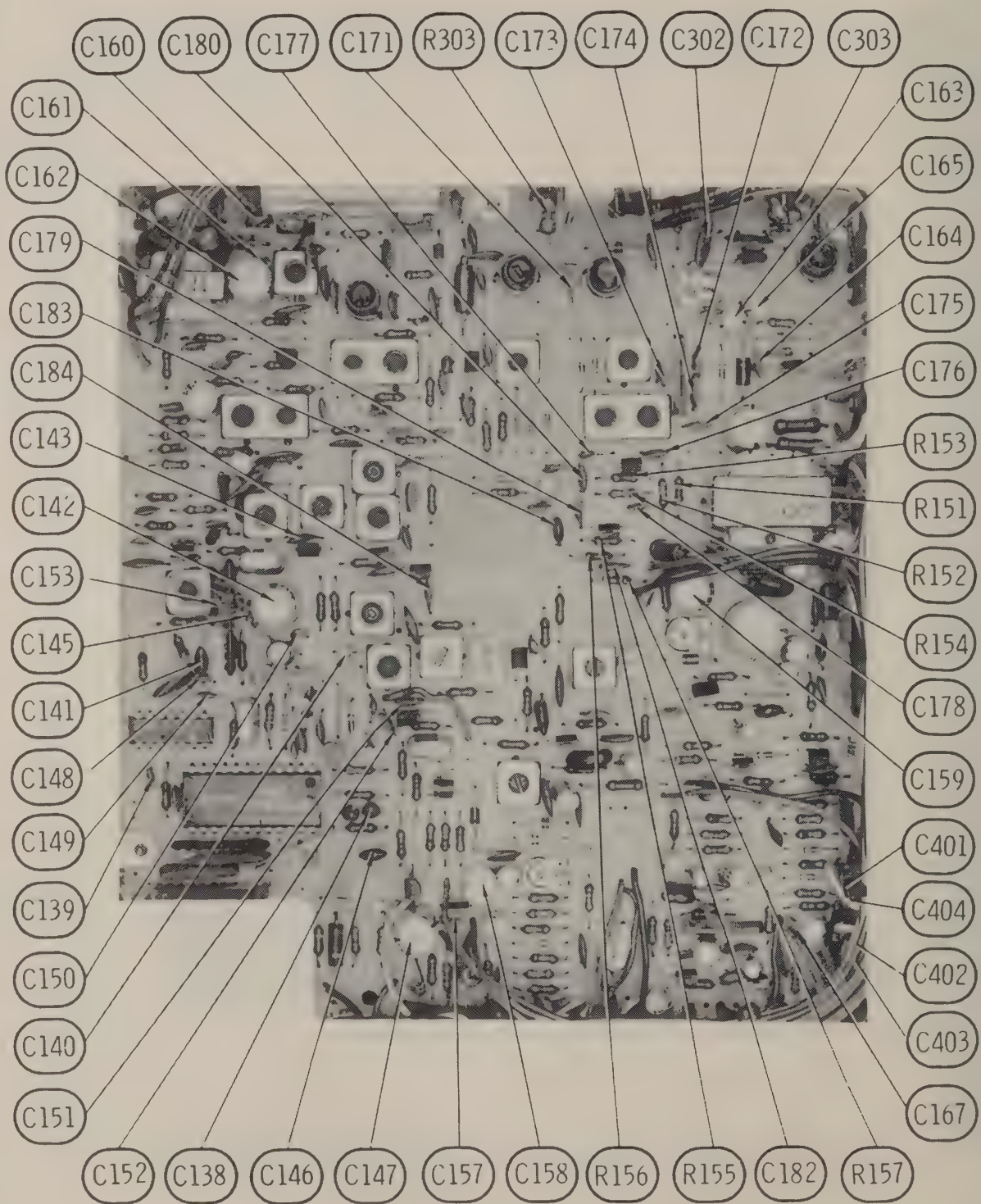
MAIN BOARD



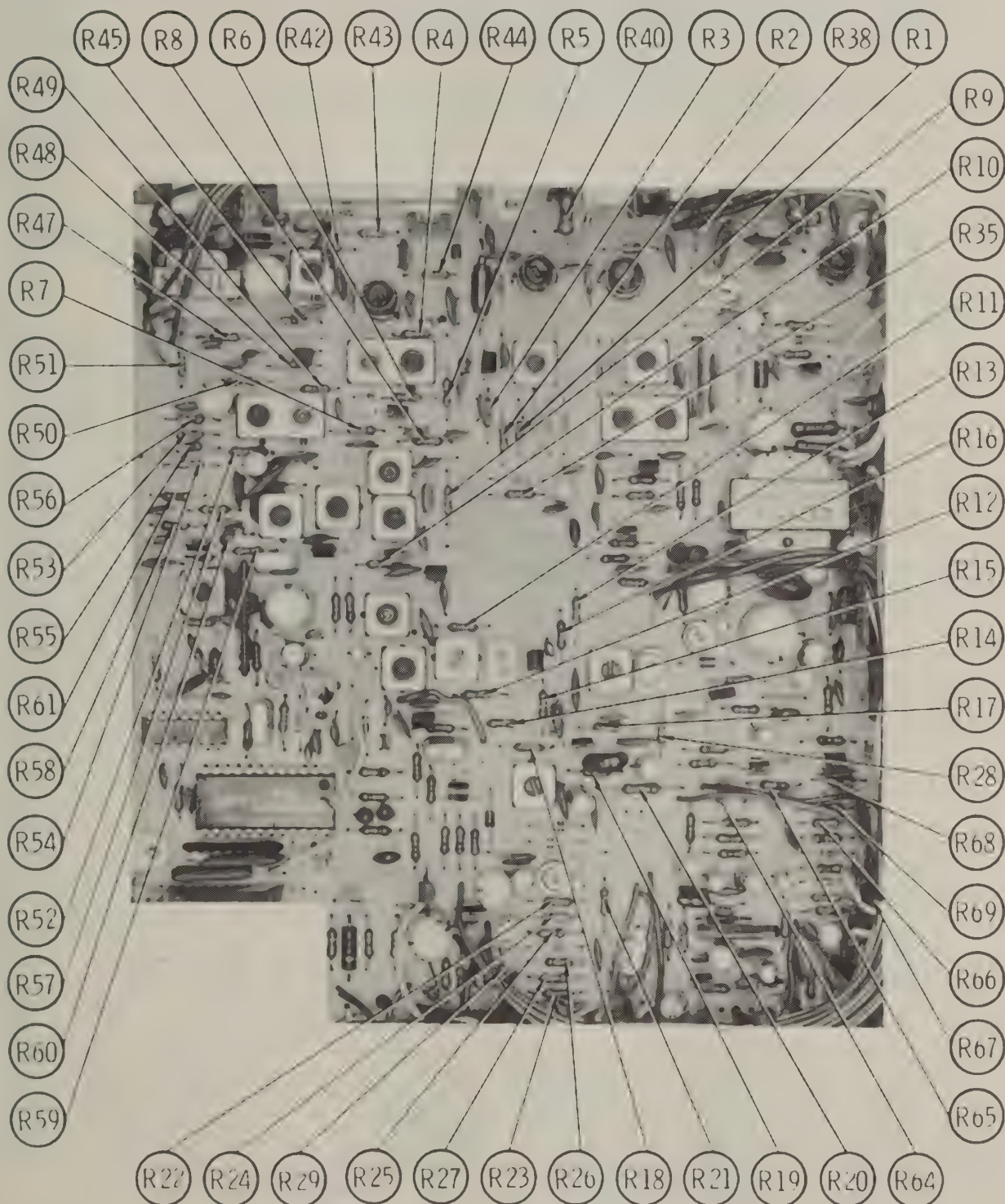
MAIN BOARD



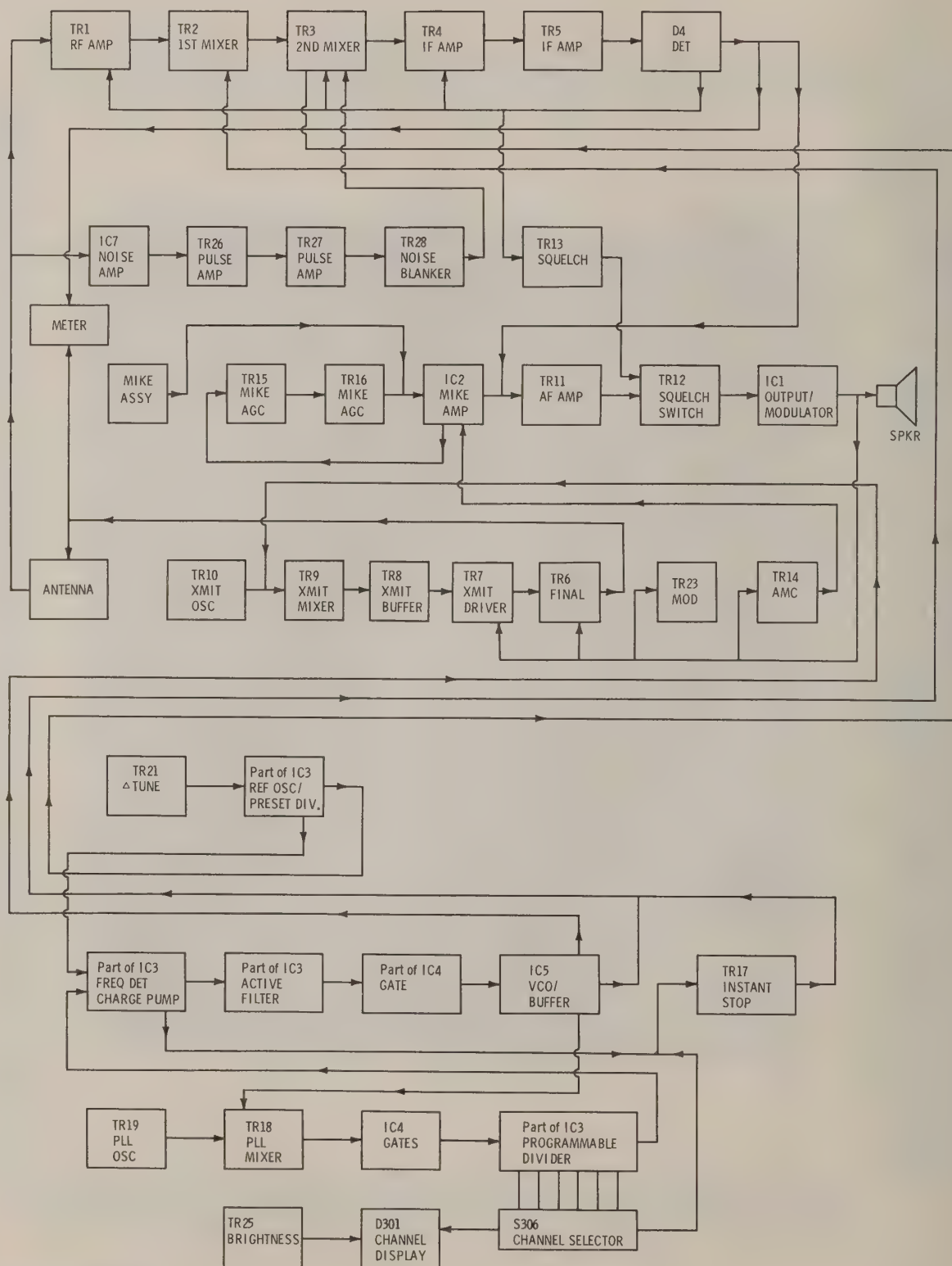
MAIN BOARD



MAIN BOARD



MAIN BOARD



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

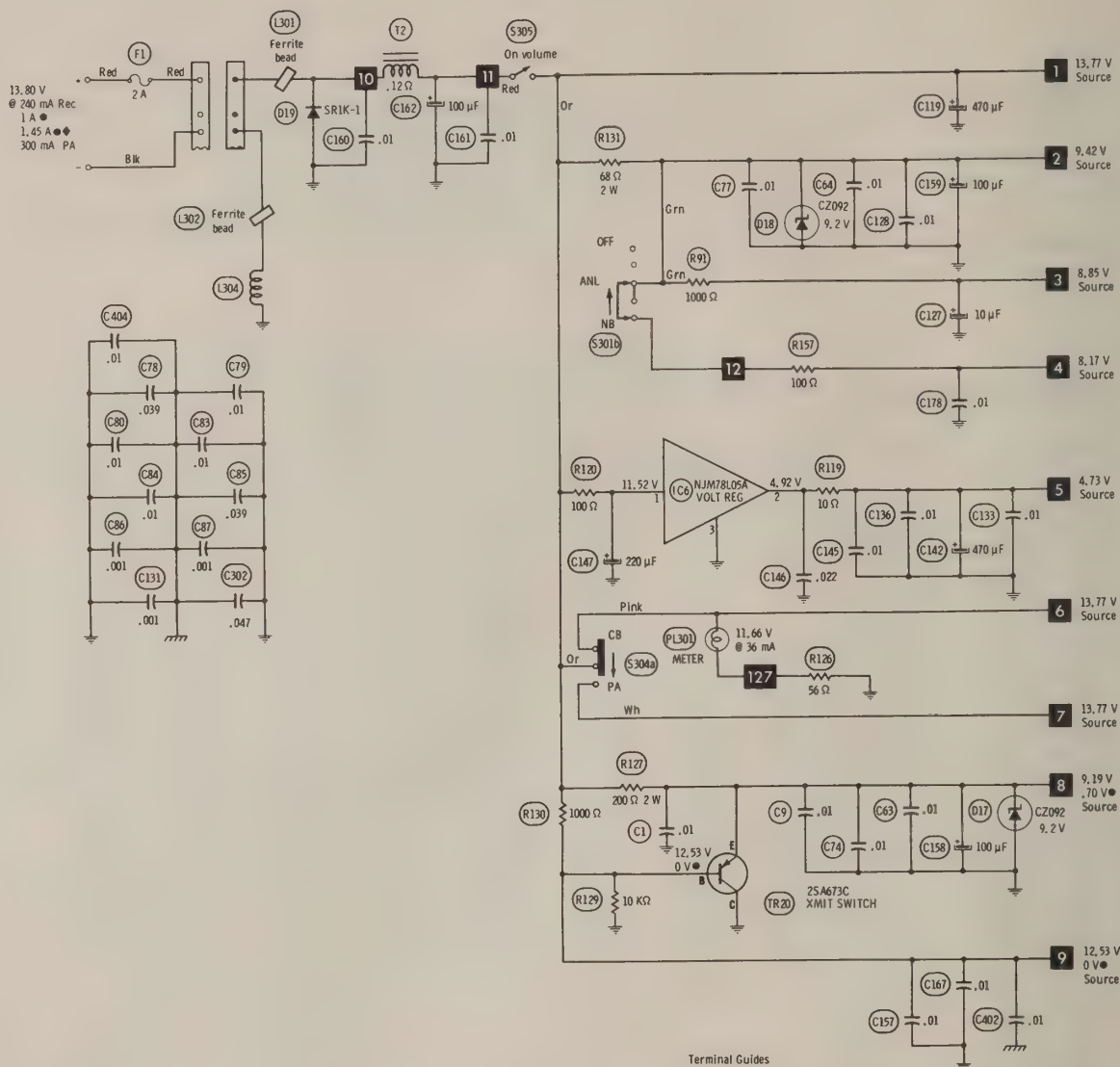
WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors 8524 (Stranded) Available in 13 Colors
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene

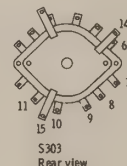
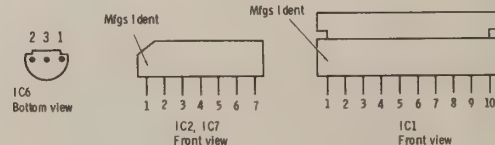
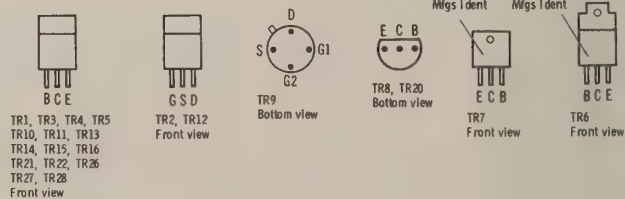
SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D2	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D3	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D4	1N60AM	150-013-9-001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D5	1N60AM	150-013-9-001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D6	1S2473K	151-066-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D7	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D8	1N60AM	150-013-9-001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D9	1N60AM	150-013-9-001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D10	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D11	SR1K-1	151-040-9-003	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D12	1S2473K	151-066-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D13	1S2473K	151-066-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D14	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D15	1S2339G	029-016-9-001	GE-90	D201		HEPR2503	RE 195	SK3126	RT-262	
D16	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D17	CZ-092	152-051-9-001	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D18	CZ-092	152-051-9-001	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D19	SR1K-1	151-040-9-003	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D20	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D21	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D22	1N60AM	150-013-9-001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D23	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D24	1S2473	151-035-9-001	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D26	1N60AM	150-013-9-001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D304	1N60AM	150-013-9-001	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
IC1	UPC1156H	307-112-9-001								
IC2	UPC592H2	307-113-9-004								
IC3	UCR858C	307-095-9-004								
IC4	MB84011U	307-113-9-001								
IC5	UHC-004	307-113-9-002								
IC6	NJM78L05A	307-113-9-003								ECG977
IC7	UPC577H	307-115-9-001								ECG1082
TR1	2SC1342B	176-074-9-001	GE-61 *	TR-24 *	PTC136 *	HEPS0014 *	RE 9 *	SK3018 *	RT-108A *	ECG229 *
TR2	2SK55D	182-045-9-001	GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
TR3	2SC460B	176-072-9-005	GE-61 *	(IR)2SC460B	PTC136 *	HEPS0014 *	RE 9	SK3018 *	RT-134	ECG107
TR4	2SC460B	176-072-9-005	GE-61 *	(IR)2SC460B	PTC136 *	HEPS0014 *	RE 9	SK3018 *	RT-134	ECG107
TR5	2SC460B	176-072-9-005	GE-61 *	(IR)2SC460B	PTC136 *	HEPS0014 *	RE 9	SK3018 *	RT-134	ECG107
TR6	2SC2092	176-074-9-003	GE-215	WEP1306	PTC186		RE 203	SK3197	RT-146	ECG235
TR7	2SC2091	176-974-9-002	GE-270		PTC180		RE 209			ECG295
TR8	2SC2076C		GE-210	(IR)2SC829B	PTC121	HEPS0015	RE 13	SK3122	RT-308	ECG123A
	2SC2076CB	176-060-9-004	GE-210	(IR)2SC829B	PTC121	HEPS0015	RE 13	SK3122	RT-308	ECG123A
TR9	3SK45		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	3SK45B	182-038-9-001	GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
TR10	2SC460B	176-072-9-005	GE-61 *	(IR)2SC460B	PTC136 *	HEPS0014 *	RE 9	SK3018 *	RT-134	ECG107
TR11	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
TR12	2SK55D	182-045-9-001	GE-FET-2	FE-100	PTC161	HEPF0021	RE 45	SK3116	RT-175	ECG312
TR13	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
TR14	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
TR15	2SA844C	177-025-9-002	GE-21 *	TR-54 *	PTC103 *	HEPS0019 *	RE 18 *	SK3114	RT-126A *	ECG129 *
TR16	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
TR17	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
TR18	3SK45		GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
	3SK45-B09	182-042-9-001	GE-FET-4	WEP905	PTC181	HEPF2004	RE 199	SK3050	RT-181	ECG222
TR19	2SC460B	176-072-9-005	GE-61 *	(IR)2SC460B	PTC136 *	HEPS0014 *	RE 9	SK3018 *	RT-134	ECG107
TR20	2SA673C	177-025-9-001	GE-269	TR-30 *	PTC103 *	HEPS5013 *	RE 26 *	SK3114	RT-126A *	ECG159 *
TR21	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
TR23	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
TR25	2SD467C	176-074-9-004	GE-88 *	TR-87 *	PTC178	HEPS3001 *	RE 17 *	SK3020 *	RT-114 *	ECG128 *
TR26	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *
TR27	2SA844D		GE-21 *	TR-54 *	PTC103 *	HEPS0019 *	RE 18 *	SK3114	RT-126A *	ECG129 *
	2SA844C	177-025-9-002	GE-21 *	TR-54 *	PTC103 *	HEPS0019 *	RE 18 *	SK3114	RT-126A *	ECG129 *
TR28	2SC458C	176-048-9-002	GE-210 *	(IR)2SC458B	PTC121 *	HEPS0009 *	RE 13 *	SK3124	RT-187	ECG123A *

COBRA MODEL 29XLR



Terminal Guides



— Circuitry not used in some versions

- - - Circuitry used in some versions

⊙ See parts list

* Nominal value

⊥ Ground

Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ♦ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

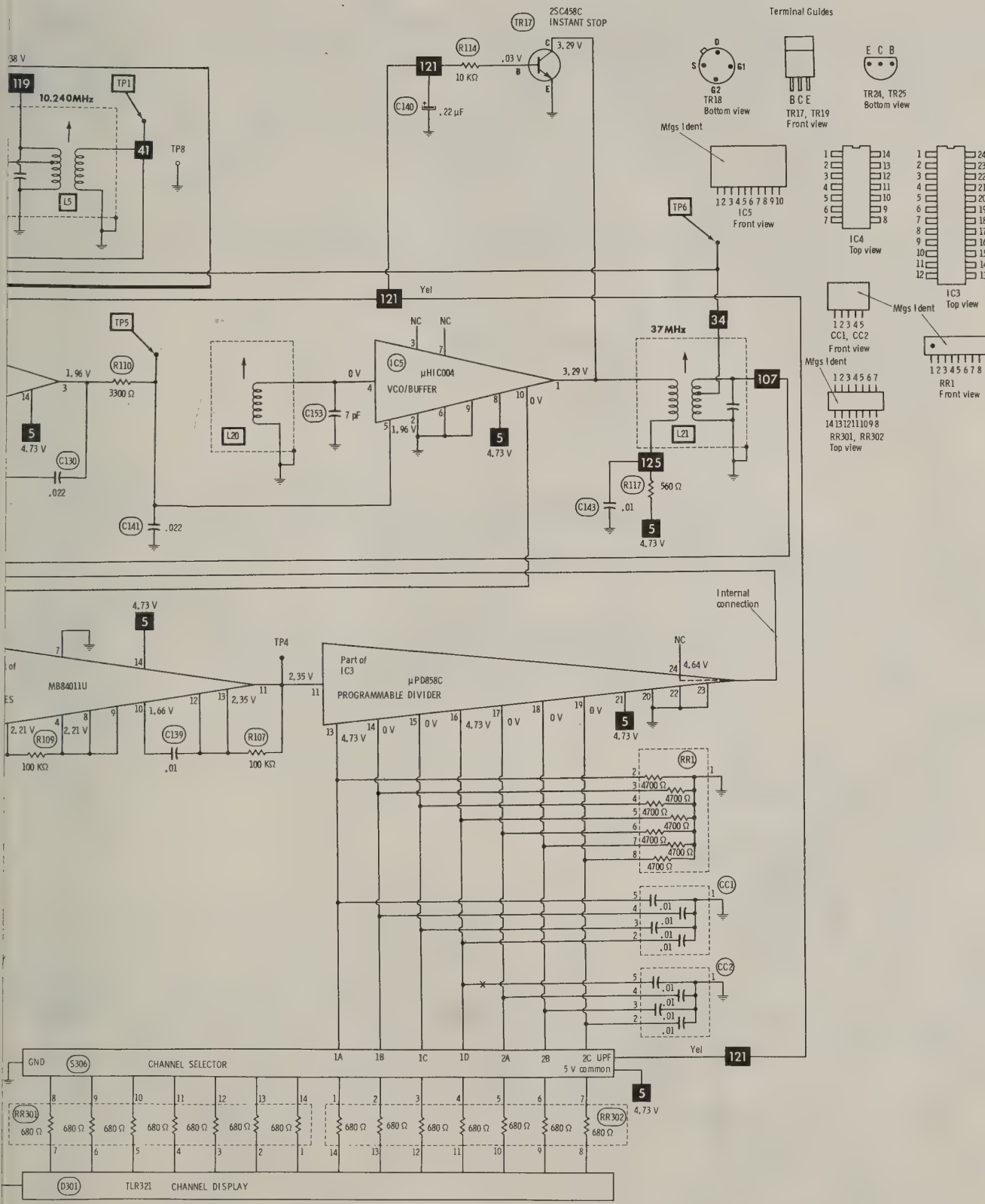
Resistors are 1/2W or less, 5% unless noted.

Value in () used in some versions.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE

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PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFGR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C15	4.7 25V	022-122-9-003	PC5-50	VTT4R7A50	QV1-27	EV-1319
C16	2.2 25V	022-122-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517
C24	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C27	1 50V	022-153-9-004	PC1-50	VTT1B63	QV1-11	EV-1615
C42	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C49	47 16V	022-156-9-004	PC50-16	VTT47D16	QV1-73	EV-1226
C88	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C93	.1 16V	033-028-9-001		TDC104M050EL	QDT1-2	SD50-R109
C95	.22 16V	033-023-9-002		TDC224M050EL	QDT1-10	SD50-R229
C97	2.2 25V	022-122-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517
C98	33 16V	022-132-9-005	PC30-25	VTT33D25	QV1-63	EV-1325
C101	33 16V	022-132-9-005	PC30-25	VTT33D25	QV1-63	EV-1325
C105	220 16V	022-122-9-008	PC250-25	VTT220G16	QV1-117	EV-1240
C106	220 16V	022-122-9-008	PC250-25	VTT220G16	QV1-117	EV-1240
C110	2.2 25V	022-122-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517
C111	.1 16V	033-028-9-001		TDC104M050EL	QDT1-2	SD50-R109
C112	.47 50V	022-152-9-003	PC1-50	VTT47B63	QV1-3	EV-1610
C113	.1 16V	033-028-9-002		TDC104M050EL	QDT1-2	SD50-R109
C117	33 16V	022-132-9-005	PC30-25	VTT33D25	QV1-63	EV-1325
C118	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C119	470 16V	022-099-9-006	PC500-16	VTT470J16	QV1-151	EV-1250
C120	.1 16V	033-028-9-001		TDC104M050EL	QDT1-2	SD50-R109
C123	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C127	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C137	2.2 16V	027-022-9-001		TDC225M050FL	QDT1-37	SD50-2R29
C138	2.2 16V	027-022-9-001		TDC225M050FL	QDT1-37	SD50-2R29
C140	.22 16V	033-023-9-002		TDC224M050EL	QDT1-10	SD50-R229
C142	470 6.3V	022-122-9-014	PC500-16	VTT470J16	QV1-149	EV-1150
C147	220 16V	022-122-9-008	PC250-25	VTT220G16	QV1-117	EV-1240
C158	100 16V	022-099-9-005	PC100-16	VTT100F16	QV1-95	EV-1230
C159	100 16V	022-099-9-005	PC100-16	VTT100F16	QV1-95	EV-1230
C162	100 25V	022-135-9-002	PC100-25	VTT100G25	QV1-97	EV-1330
C163	1 50V	022-153-9-004	PC1-50	VTT1B63	QV1-11	EV-1615
C165	2.2 25V	022-122-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517

CAPACITORS

ITEM No.	RATING	MFGR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C2	22 N220	02-176-9-006			*		10TCR-Q22
C3	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C4	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C5	1.5 NPO		DTZ-1R5	NP01P5	CN0515		10TCC-V15
C6	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C7	.02		DC-203	MGP02	TA120	QC2-157	TG-S20
C8	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C9	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C10	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C11	5		DTZ-4R7	NP04P7	CN0547		10TCC-V47
C12	.039	020-178-9-021					
C13	.039	020-178-9-021					
C14	.039	020-178-9-021					
C18	2 N220	020-176-9-003			*		
C19	.022			DPMS2S22	EWF1A122	QF1-127	1PB-S22
C20	.039	020-176-9-003					
C21	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C22	.068			WMF1S68	EWF1A168	QF1-195	1PB-S68
C23	.039	020-176-9-003					
C25	.0047		DD-472	GP4700	GP247		5GA-D47
C26	.0047		DD-472	GP4700	GP247		5GA-D47
C29	.0047		DD-472	GP4700	GP247		5GA-D47
C30	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C34	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C40	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C41	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C43	56		DD-560		GP456		10TS-Q56
C44	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C45	.039	020-178-9-021					
C50	300		DD-301	GP300	GP330		10TS-T30
C51	.0047		DD-472	GP4700	GP247		5GA-D47
C52	.039	020-178-9-021					
C53	100		DD-101	GP100	GP310		10TS-T10
C57	220		DD-221		GP322		10TS-T22
C58	180		DD-181		GP318		10TS-T18
C59	.02		DC-203	MGP02	TA120	QC2-157	TG-S20
C60	330		DD-331	GP330	GP333		10TS-T33
C61	.039	020-178-9-021					
C62	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C63	.01		DC-103	MGP01	TA110	QC2-141	TG-S10

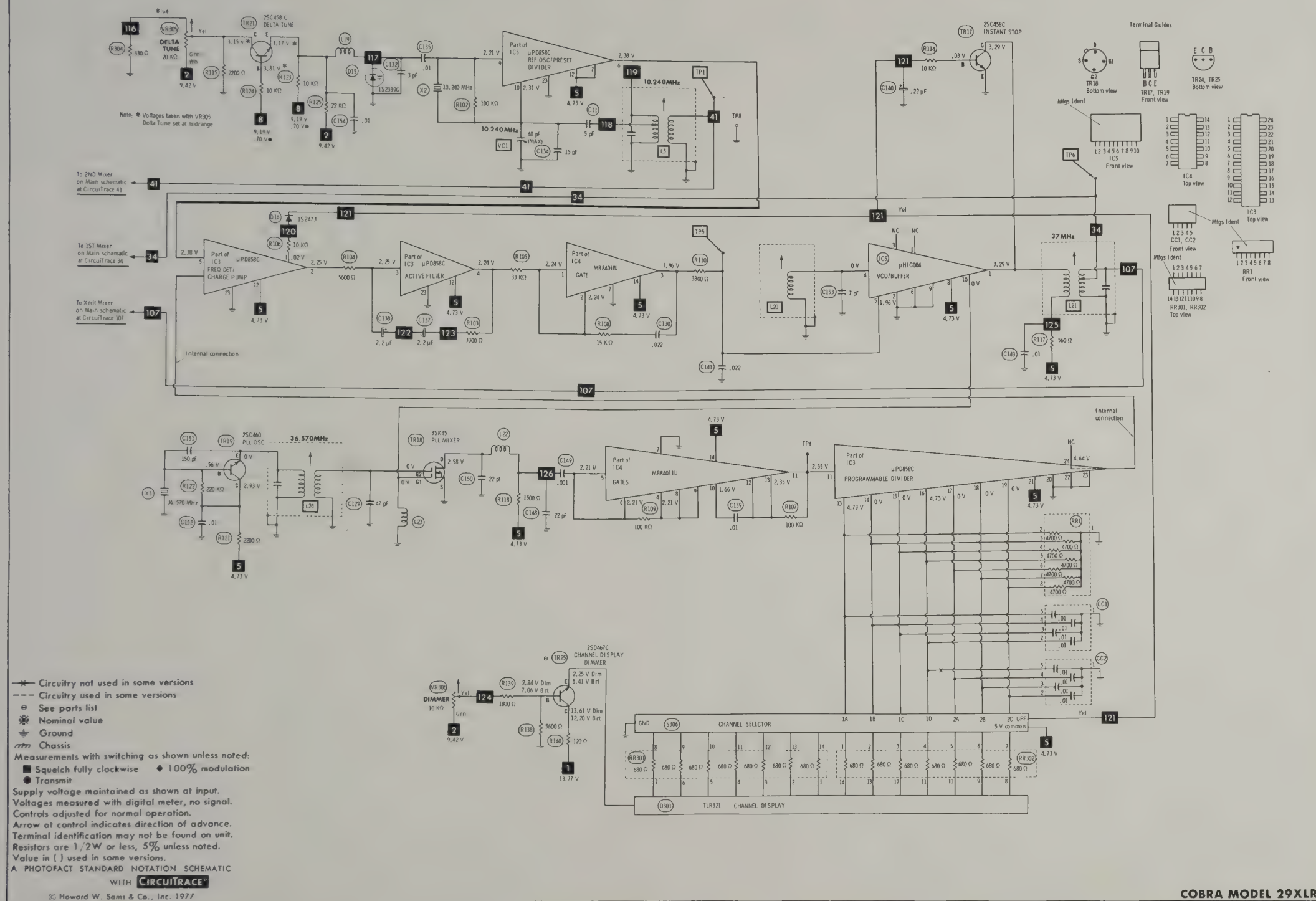
PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C64	.01	020-178-9-021	DC-103	MGP01	TA110	QC2-141	TG-S10
C65	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C66	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C67	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C68	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C69	330		DD-331	GP330	GP333		10TS-T33
C70	.0047		DD-472	GP4700	GP247		5GA-D47
C71	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C72	100		DD-101	GP100	GP310		10TS-T10
C73	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C74	.01	020-178-9-021	DC-103	MGP01	TA110	QC2-141	TG-S10
C76	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C77	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C78	.039						
C79	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C80	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C83	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C84	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C85	.039						
C86	.001	020-178-9-021	DD-102G	GP1000	GP210	QC2-81	5GA-D10
C87	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C89	.001			DPMS6D1	EWFA1210	QF1-1	1PB-D10
C90	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C91	100		DD-101	GP100	GP310		10TS-T10
C92	100		DD-101	GP100	GP310		10TS-T10
C96	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C99	68		DD-680	GP68	GP468		10TS-Q68
C100	.068			WMF1S68	EWFA168	QF1-195	1PB-S68
C102	.068			WMF1S68	EWFA168	QF1-195	1PB-S68
C103	220	020-178-9-002	DD-221		GP322		10TS-T22
C104	.022			DPMS2S22	EWFA122	QF1-127	1PB-S22
C107	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C114	330		DD-331	GP330	GP333		10TS-T33
C115	33		DTZ-33	NP033	CN0433		10TCC-Q33
C116	.039			DPMS6S39	PVC6139		6PS-S39
C121	.0047		DD-472	GP4700	GP247		5GA-D47
C122	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C124	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C125	.0047		DD-472	GP4700	GP247		5GA-D47
C126	.001	020-178-9-002	DD-102G	GP1000	GP210	QC2-81	5GA-D10
C128	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C129	47		DTZ-47	NP047	CN0447		10TCC-Q47
C130	.022			DPMS2S22	EWFA122	QF1-127	1PB-S22
C131	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C132	3 N220				*		
C133	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C134	15 N220				*		10TCR-Q15
C135	.01	020-176-9-005	DC-103	MGP01	TA110	QC2-141	TG-S10
C136	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C139	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C141	.022			DPMS2S22	EWFA122	QF1-127	1PB-S22
C143	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C145	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C146	.022			DPMS2S22	EWFA122	QF1-127	1PB-S22
C148	22		DTZ-22	NP022	CN0422		10TCC-Q22
C149	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C150	22		DTZ-22	NP022	CN0422		10TCC-Q22
C151	150	020-178-9-003	DD-151		GP315		10TS-T15
C152	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C153	7 N220				*		
C154	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C157	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C160	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C161	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C164	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C167	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C168	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C171	27 N220	020-178-9-003			*		10TCR-Q27
C172	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C173	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C174	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C175	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C176	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C177	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C178	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C179	100		DD-101	GP100	GP310		10TS-T10
C180	180		DD-181		GP318		10TS-T18
C182	330	020-178-9-003	DD-331	GP330	GP333		10TS-T33
C183	.001			DPMS6D1	EWFA1210	QF1-1	1PB-D10
C184	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C301	180		DD-181		GP318		10TS-T18
C302	.047		UK12-503		MAG1215		HY-350
C303	33		DTZ-33	NP033	CN0433		10TCC-Q33
C304	.01		DC-103	MGP01	TA110	QC2-141	TG-S10

COBRA MODEL 29XLR



PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C15	4.7 25V	022-122-9-003	PC5-50	VTT4R7A50	QV1-27	EV-1319
C16	2.2 25V	022-122-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517
C24	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C27	1 50V	022-153-9-004	PC1-50	VTT1B63	QV1-11	EV-1615
C42	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C49	47 16V	022-156-9-004	PC50-16	VTT47D16	QV1-73	EV-1226
C88	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C93	1 16V	033-028-9-001	DC104M050EL	TDCT04M050EL	QDT1-2	SD50-R109
C95	22 16V	033-023-9-002	DC224M050EL	TDCT24M050EL	QDT1-10	SD50-R229
C97	2.2 25V	022-122-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517
C98	33 16V	022-132-9-005	PC30-25	VTT33D25	QV1-63	EV-1325
C101	33 16V	022-132-9-005	PC30-25	VTT33D25	QV1-63	EV-1325
C105	220 16V	022-122-9-008	PC250-25	VTT220G16	QV1-117	EV-1240
C106	220 16V	022-122-9-008	PC250-25	VTT220G16	QV1-117	EV-1240
C110	2.2 25V	022-122-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517
C111	1 16V	033-028-9-001	DC104M050EL	TDCT04M050EL	QDT1-2	SD50-R109
C112	47 50V	022-152-9-003	PC1-50	VTT47B63	QV1-3	EV-1610
C113	1 16V	033-028-9-002	DC104M050EL	TDCT04M050EL	QDT1-2	SD50-R109
C117	33 16V	022-132-9-005	PC30-25	VTT33D25	QV1-63	EV-1325
C118	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C119	470 16V	022-099-9-006	PC500-16	VTT470J16	QV1-151	EV-1250
C120	1 16V	033-028-9-001	DC104M050EL	TDCT04M050EL	QDT1-2	SD50-R109
C123	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C127	10 16V	022-120-9-001	PC10-25	VTT10A25	QV1-41	EV-1222
C137	2.2 16V	027-022-9-001	DC222M050FL	TDCT22M050FL	QDT1-37	SD50-2R29
C138	2.2 16V	027-022-9-001	DC222M050FL	TDCT22M050FL	QDT1-37	SD50-2R29
C140	22 16V	033-023-9-002	DC224M050EL	TDCT24M050EL	QDT1-10	SD50-R229
C142	470 6.3V	022-122-9-014	PC500-16	VTT470J16	QV1-149	EV-1150
C147	220 16V	022-122-9-008	PC250-25	VTT220G16	QV1-117	EV-1240
C158	100 16V	022-099-9-005	PC100-16	VTT100F16	QV1-95	EV-1230
C159	100 16V	022-099-9-005	PC100-16	VTT100F16	QV1-95	EV-1230
C162	100 25V	022-135-9-002	PC100-25	VTT100G25	QV1-97	EV-1330
C163	1 50V	022-153-9-004	PC1-50	VTT1B63	QV1-11	EV-1615
C165	2.2 25V	022-122-9-002	PC2-100	VTT2R2A50	QV1-19	EV-1517

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA			
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.
						Q-LINE GENERAL LINE
C1	.01	02-176-9-006	DC-103	MGPO1	TA110	QC2-141 TG-S10
C2	22 N220		DC-103	MGPO1	TA110	10TCR-Q22
C3	.01		DC-103	MGPO1	TA110	TG-S10
C4	.01		DC-103	MGPO1	TA110	TG-S10
C5	1.5 NPO		DTZ-1R5	NP01P5	CN0515	10TCC-V15
C6	.01		DC-103	MGPO1	TA110	TG-S10
C7	.02		DC-103	MGPO2	TA120	QC2-141 TG-S10
C8	.01		DC-103	MGPO1	TA110	QC2-157 TG-S20
C9	.01		DC-103	MGPO1	TA110	QC2-141 TG-S10
C10	.01		DC-103	MGPO1	TA110	QC2-141 TG-S10
C11	5	020-178-9-021	DTZ-4R7	NP04P7	CN0547	QC2-141 TG-S10
C12	.039					10TCC-V47
C13	.039					
C14	.039					
C18	2 N220					
C19	.022					
C20	.039					
C21	.01					
C22	.068					
C23	.039					
C25	.0047	020-176-9-003	DC-103	MGPO1	TA110	QC2-141 TG-S10
C26	.0047		DD-472	GP4700	GP247	1PB-S68
C29	.0047		DD-472	GP4700	GP247	
C30	.01		DD-472	GP4700	GP247	56A-D47
C34	.01		DC-103	MGPO1	TA110	56A-D47
C40	.001		DD-102G	GP1000	GP210	TG-S10
C41	.01		DC-103	MGPO1	TA110	QC2-81
C43	56		DD-560	GP456	GP456	TG-S10
C44	.01		DC-103	MGPO1	TA110	10TS-Q56
C45	.039					TG-S10
C50	300	020-178-9-021	DD-301	GP330	GP330	10TS-T30
C51	.0047		DD-472	GP4700	GP247	56A-D47
C52	.039					
C53	100		DD-101	GP100	GP310	10TS-T10
C57	220		DD-221		GP322	10TS-T22
C58	180		DD-181		GP318	10TS-T18
C59	.02		DC-203	MGPO2	TA120	TG-S20
C60	330		DD-331	GP330	GP333	10TS-T33
C61	.039	020-178-9-021				
C62	.01		DC-103	MGPO1	TA110	QC2-141 TG-S10
C63	.01		DC-103	MGPO1	TA110	QC2-141 TG-S10

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C64	.01	020-178-9-021	DC-103	MGP01	TA110	QC2-141	TG-S10
C65	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C66	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C67	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C68	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C69	330		DD-331	GP330	GP333		10TS-T33
C70	.0047		DD-472	GP4700	GP247		5GA-D47
C71	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C72	100		DD-101	GP100	GP310		10TS-T10
C73	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C74	.01	020-178-9-021	DC-103	MGP01	TA110	QC2-141	TG-S10
C76	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C77	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C78	.039						
C79	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C80	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C83	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C84	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C85	.039						
C86	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C87	.001	020-178-9-021	DD-102G	GP1000	GP210	QC2-81	5GA-D10
C89	.001			DPMS6D1	EWFA1210	QF1-1	1PB-D10
C90	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C91	100		DD-101	GP100	GP310		10TS-T10
C92	100		DD-101	GP100	GP310		10TS-T10
C96	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C99	68		DD-680	GP68	GP468		10TS-Q68
C100	.068			WMF1S68	EWFA1168	QF1-195	1PB-S68
C102	.068			WMF1S68	EWFA1168	QF1-195	1PB-S68
C103	220		DD-221		GP322		10TS-T22
C104	.022	020-178-9-002		DPMS2S22	EWFA1122	QF1-127	1PB-S22
C107	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C114	330		DD-331	GP330	GP333		10TS-T33
C115	33		DTZ-33	NP033	CN0433		10TCC-Q33
C116	.039			DPMS6S39	PVC6139		6PS-S39
C121	.0047		DD-472	GP4700	GP247		5GA-D47
C122	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C124	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C125	.0047		DD-472	GP4700	GP247		5GA-D47
C126	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C128	.01	020-178-9-005	DC-103	MGP01	TA110	QC2-141	TG-S10
C129	47		DTZ-47	NP047	CN0447		10TCC-Q47
C130	.022			DPMS2S22	EWFA1122	QF1-127	1PB-S22
C131	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C132	3 N220				*		
C133	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C134	15 N220				*		10TCR-Q15
C135	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C136	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C139	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C141	.022	020-178-9-003		DPMS2S22	EWFA1122	QF1-127	1PB-S22
C143	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C145	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C146	.022			DPMS2S22	EWFA1122	QF1-127	1PB-S22
C148	22		DTZ-22	NP022	CN0422		10TCC-Q22
C149	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C150	22		DTZ-22	NP022	CN0422		10TCC-Q22
C151	150		DD-151	GP315	GP315		10TS-T15
C152	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C153	7 N220				*		
C154	.01	020-178-9-003	DC-103	MGP01	TA110	QC2-141	TG-S10
C157	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C160	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C161	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C164	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C167	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C168	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C171	27 N220				*		10TCR-Q27
C172	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C173	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C174	.01	020-178-9-003	DC-103	MGP01	TA110	QC2-141	TG-S10
C175	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C176	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C177	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C178	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C179	100		DD-101	GP100	GP310		10TS-T10
C180	180		DD-181	GP318	GP318		10TS-T18
C182	330		DD-331	GP330	GP333		10TS-T33
C183	.001			DPMS6D1	EWFA1210	QF1-1	1PB-D10
C184	.01			MGP01	TA110	QC2-141	TG-S10
C301	180	020-178-9-003	DD-181	GP318	GP318		10TS-T18
C302	.047		UK12-503	MAG1215	MAG1215		HY-350
C303	33		DTZ-33	NP033	CN0433		10TCC-Q33
C304	.01		DC-103	MGP01	TA110	QC2-141	TG-S10

COBRA MODEL 29XLR

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C401	.001		DD-102G	GP1000	GP210	QC2-81	5GA-D10
C402	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C403	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C404	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
CC1	.01	527-077-9-002 (1)					
CC2	.01	527-077-9-002 (1)					
VC1	40	028-046-9-001					

*Not normally in distributor's stock. Available thru distributor on order to manufacturer.
(1) Consists of four .01 capacitors.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	S Meter	20K	008-311-9-002				
VR2	AGC	50K	008-308-9-005				
VR3	Squelch Range	50K	008-308-9-005				
VR4	RF Meter	10K	008-311-9-001	T-10K (4)	C-103 (4)	MTC14L1 (4)	X201R103B (4)
VR5	AMC	5000	008-308-9-004				
VR301	Volume/Switch	50K	008-308-9-003				
VR302	Squelch	20K	008-311-9-003				
VR303	Dynamike	10K	008-311-9-005				
VR304	RF Gain	50K	008-311-9-004				
VR305	Delta Tune	20K	008-308-9-001				
VR306	Dimmer	10K	RV-064 (5)				
VR308	SWR/CAL	20K	008-308-9-002				
			008-311-9-003				

(4) Modify terminals to fit PC board.

(5) Number on unit.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
RR1	4700		527-016-9-001 (1)	RR302	680		527-076-9-002 (2)
RR301	680		527-076-9-002 (2)				

(1) Consists of seven 4700-ohm resistors.

(2) Consists of seven 680-ohm resistors.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Rec Antenna (27MHz)	066-017-9-001			
L2	Rec RF (27MHz)	060-024-9-012			
L3	IF (10.7MHz)	060-024-9-001			
L4	IF (10.7MHz)	060-024-9-002			
L5	Ref Osc (10.240MHz)	060-024-9-003			
L6	IF (455kHz)	060-022-9-001			
L7	IF (455kHz)	060-024-9-004			
L8	IF (455kHz)	060-024-9-005			
L9	RF Choke	044-042-9-002			
L10	TVI Trap (54MHz)	044-028-9-004			
L11	Antenna Match (27MHz)	044-028-9-005			
L12	Final Amp (27MHz)	041-056-9-003			
L13	RF Choke	044-028-9-003			
L15	Xmit Driver (27MHz)	044-028-9-004			
L16	Xmit Buffer (27MHz)	060-024-9-010			
L17	Xmit Mixer (27MHz)	060-024-9-006			
L18	Xmit Osc (10MHz)	060-024-9-011			
L19	RF Choke (33uH)	041-090-9-002			
L20	VCO Buffer	060-024-9-008			

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

COILS (RF-IF)(cont)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L21	VCO Buffer (37MHz)	060-024-9-009			
L22	RF Choke (100uH)	041-062-9-002			
L23	RF Choke (1.5uH)	041-090-9-001			
L24	PLL Osc (36.570MHz)	060-024-9-007			
L27	Noise Amp (23.5MHz)	066-017-9-001			
L28	Noise Amp (23.5MHz)	060-026-9-001			
L303	RF Choke	044-044-9-001			
L304	RF Choke	044-028-9-003			
L305	RF Choke	044-044-9-001			
L307	RF Choke	044-044-9-001			
L309	RF Choke	044-044-9-001			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	1.45 Amp	.1	1mH	044-028-9-006	TR507		

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	67	1 8 2 54	061-031-9-001 (TF-107) (1)			(1) On Unit.

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP301	4" PM 8 ohm	580-013-9-001	4A05Z8R	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2 Amp	191-251-9-002	426-080-9-001	AGC2	HDJ	B12002	150145	FG2-2

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIKE	562-018-9-001	18-032	18-034	18-010	18-092	2	1	3	4	NC	1

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	10.695	133-014-9-002	CC90W10695	Xmit Osc.	X3	36.570	133-014-9-003		PLL Osc.
X2	10.240	133-014-9-001		Ref Osc.					

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
D301	LED	158-014-9-001	Channel Display Modulation Indicator
D302	LED	158-015-9-001	
L14	Ferrite Bead	763-081-9-003	
L25	Ferrite Bead	763-081-9-003	
L301	Ferrite Bead	044-042-9-001	S/Rf/SWR NB/ANL SWR/CAL/ S - RF CB/PA Power (On Volume Control) Channel Selector Hi Cut/Off 10.7MHz 455kHz Main (PC-198AA) Mike Jack (PC-181AA) Channel Selector (PC-207AA)
L302	Ferrite Bead	044-042-9-001	
L306	Ferrite Bead	763-084-9-003	
L308	Ferrite Bead	763-084-9-003	
L310	Ferrite Bead	763-084-9-003	
L312	Ferrite Bead	763-084-9-003	
M301	Meter	320-087-9-001	
S301	Switch	084-057-9-001	
S303	Switch	084-057-9-001	
S304	Switch	084-055-9-001	
S305	Switch		
S306	Switch	083-220-9-001	
S307	Switch	084-055-9-001	
XF1	Ceramic Filter	140-018-9-001	10.7MHz 455kHz
XF2	Ceramic Filter	140-018-9-002	
	Flat Cable	426-022-9-001	
	Printed Circuit Board	302-233-9-001	
	Printed Circuit Board	302-239-9-001	
	Printed Circuit Board	302-240-9-001	

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Escutcheon	255-150-9-001	Cabinet, Top	253-056-9-001
Knob, Channel	751-146-9-003	Cabinet, Bottom	253-056-9-002
Knob, Control	751-146-8-001	Mounting Bracket	251-204-9-001
Knob, Dimmer	751-146-9-002	Mike Hanger	741-074-9-001



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL 2310

COMMANDO MODEL 2310

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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Printed in U. S. of America

7CY514

ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period. Adjustments made with 13.8-volt DC input. Connect low sides of test equipment to ground unless specified otherwise. Connect 50-ohm dummy load or antenna before keying transmitter.

Suggested Alignment Tools: GC ELECTRONICS:
 L5, T13, T14, T15, T16, T17 5009
 T2 thru T7, T11, T12, T18 9440
 CV1, CV2 5000

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Inputs of frequency counter and RF VTVM to TP1.	Ch. 13	T18	Adjust for maximum at 37.750MHz.
Input of frequency counter to TP1.	Ch. 17 Ch. 21 Ch. 1 Ch. 5 Ch. 9		Check for 37.800MHz. Check for 37.850MHz. Check for 37.600MHz. Check for 37.650MHz. Check for 37.700MHz.
Inputs of frequency counter and RF VTVM to TP2.	Ch. 13	T14	Adjust for maximum at 10.180MHz.
Input of frequency counter to TP2.	Ch. 14 Ch. 15 Ch. 16		Check for 10.170MHz. Check for 10.160MHz. Check for 10.140MHz.
Inputs of frequency counter and RF VTVM to TP3.	Ch. 13, Xmit	T1	Adjust for maximum at 10.635MHz.
Input of frequency counter to TP3.	Ch. 14, Xmit Ch. 15, Xmit Ch. 16, Xmit		Check for 10.625MHz. Check for 10.615MHz. Check for 10.595MHz.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication. Set generator output low enough to prevent AGC limiting.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP4. 455kHz, 1000Hz, @ 30% modulation.	Ch. 13	T17, T16, T15	Adjust for maximum output.
Output of signal generator thru .01uF to TP5. 10.6MHz, 1000Hz @ 30% modulation.	Ch. 13	T13	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation.	Ch. 13	T12, T11	Adjust for maximum output. Repeat above steps, if necessary.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 13	RV2	S METER Adjust RV2 for 9 on S scale of meter.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.

See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of spectrum analyzer to antenna jack.	Ch. 13	T2, T3, T4, T5, T6, T7, L3, L5, CV1	Adjust for maximum.
	Ch. 13	CV1	Adjust for 4 watts maximum.
	Ch. 13	CV2	Adjust for MINIMUM at 54MHz.

COMMANDO MODEL 2310

TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

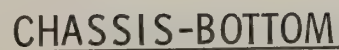
NOTE: Be sure to check transmit frequency and power on all active channels after adjustments of transmitter.

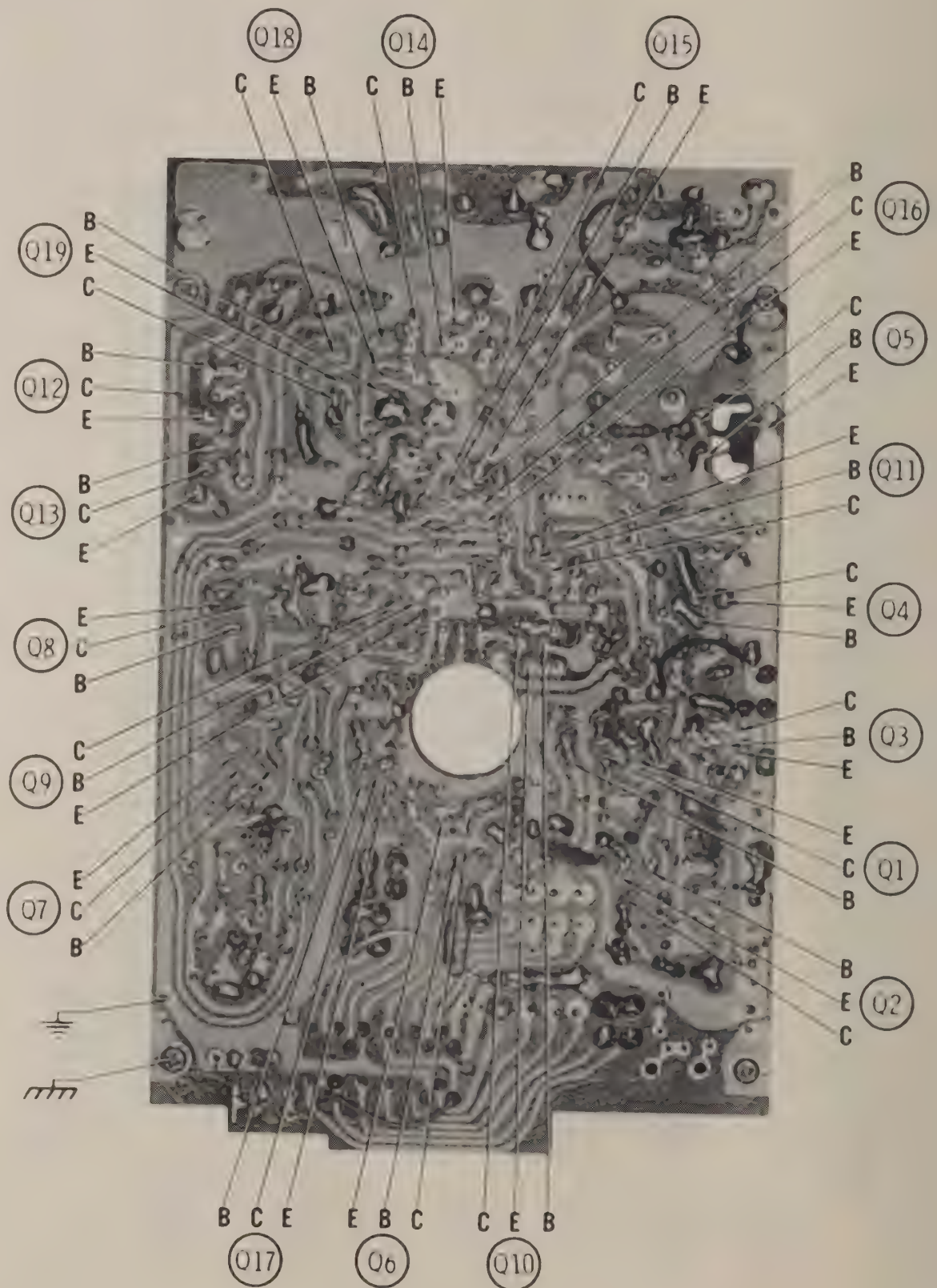
See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Modulation meter to antenna jack. Inject a 1000Hz signal at Mic input.	Ch. 13	RV5	AMC Insert a blank speaker jack into phone plug to disable AMC. Adjust signal for over-modulation. Remove jack. Adjust RV5 for 100% modulation maximum.
	Ch. 13	RV1	RF PANEL METER Adjust RV1 so that RF Panel meter agrees with RF wattmeter.

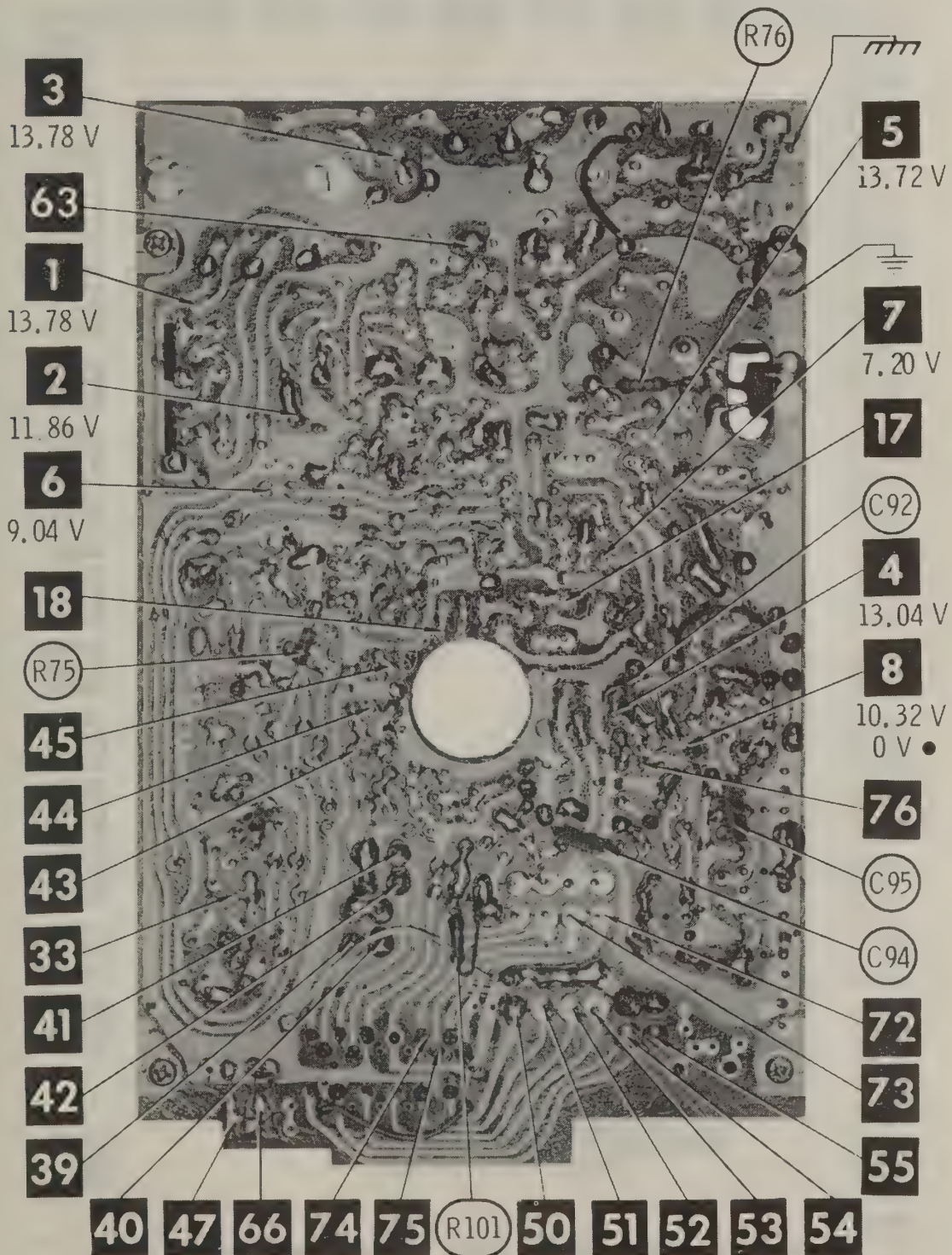


MAIN BOARD



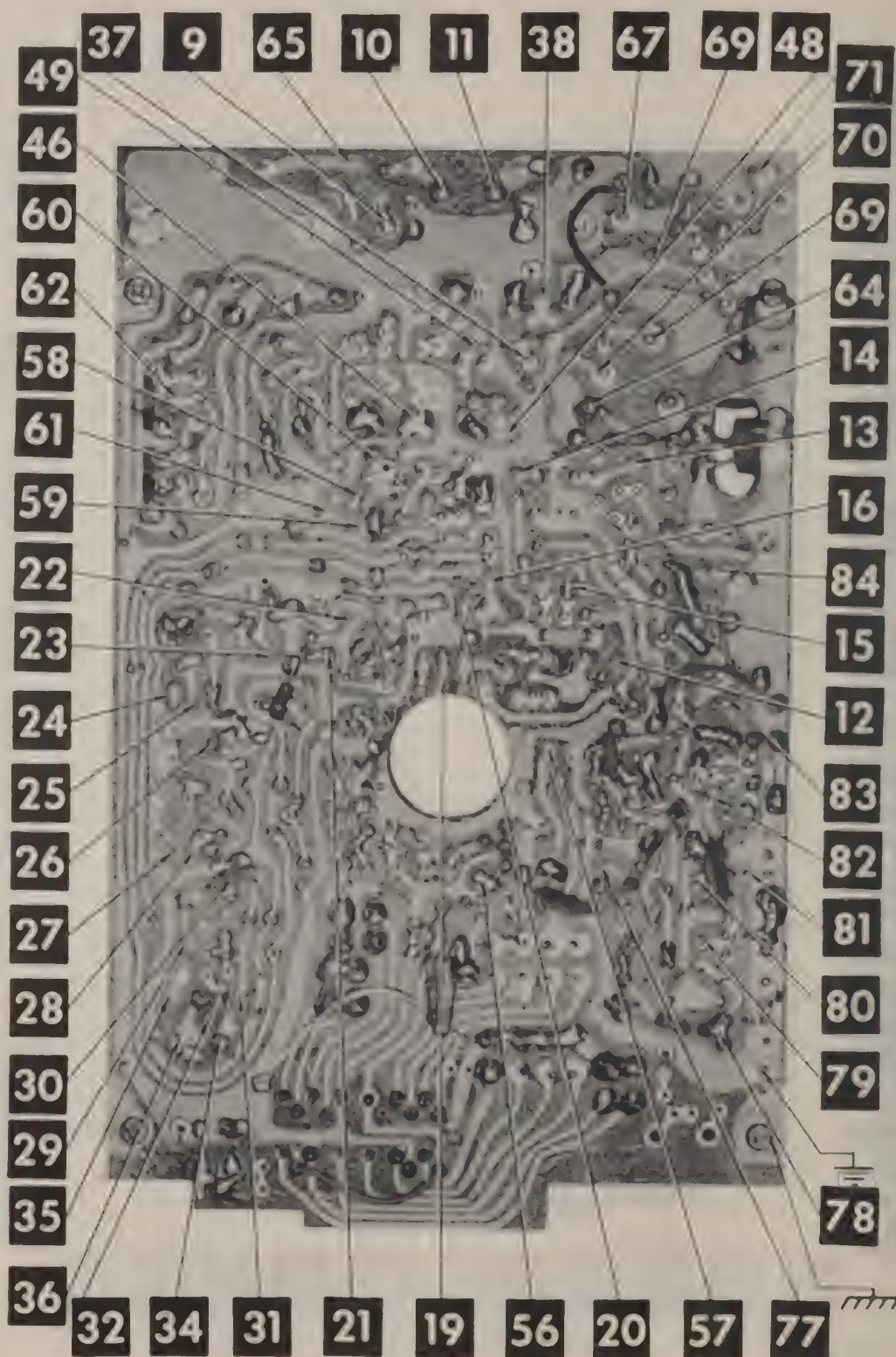


MAIN BOARD

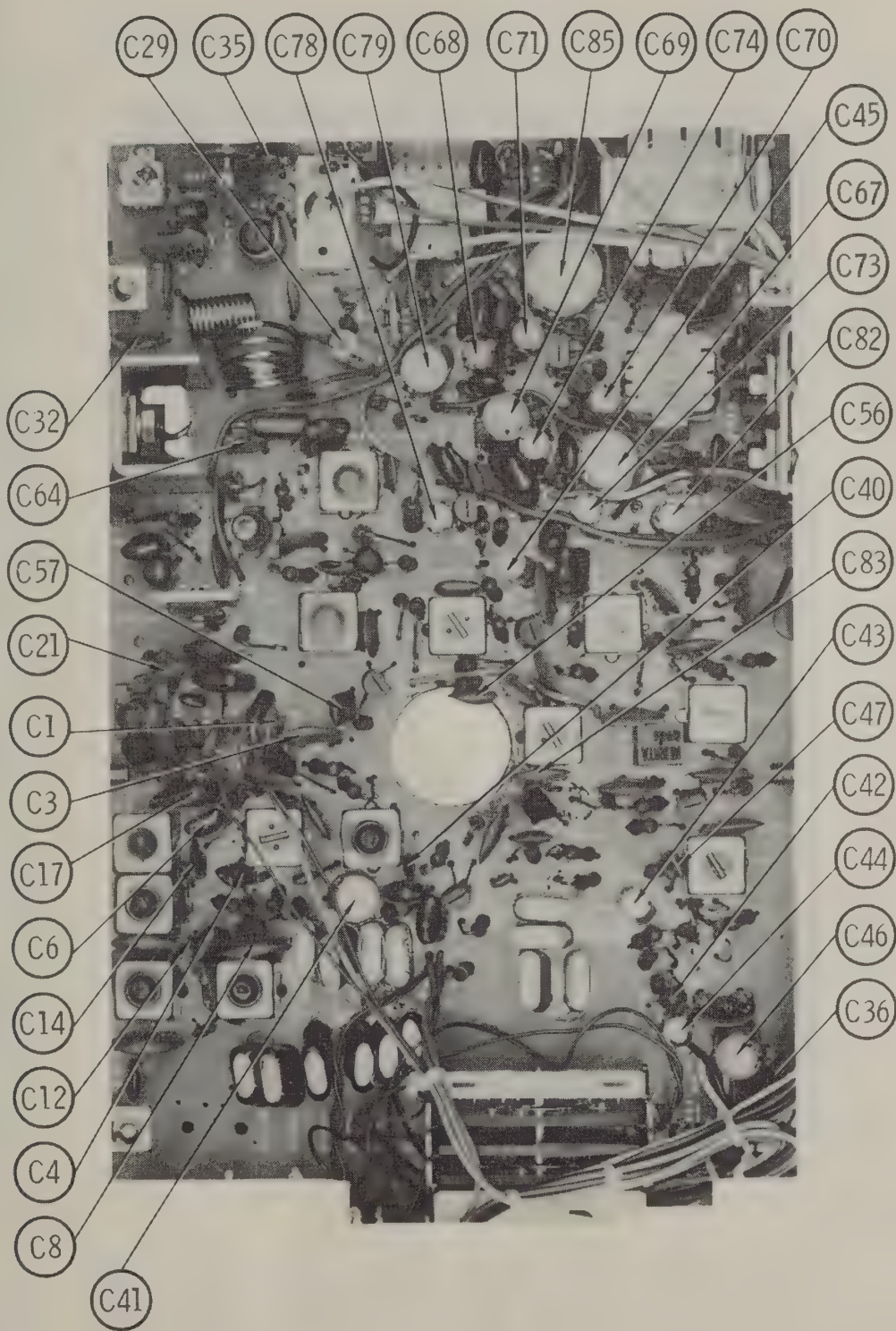


• Transmit

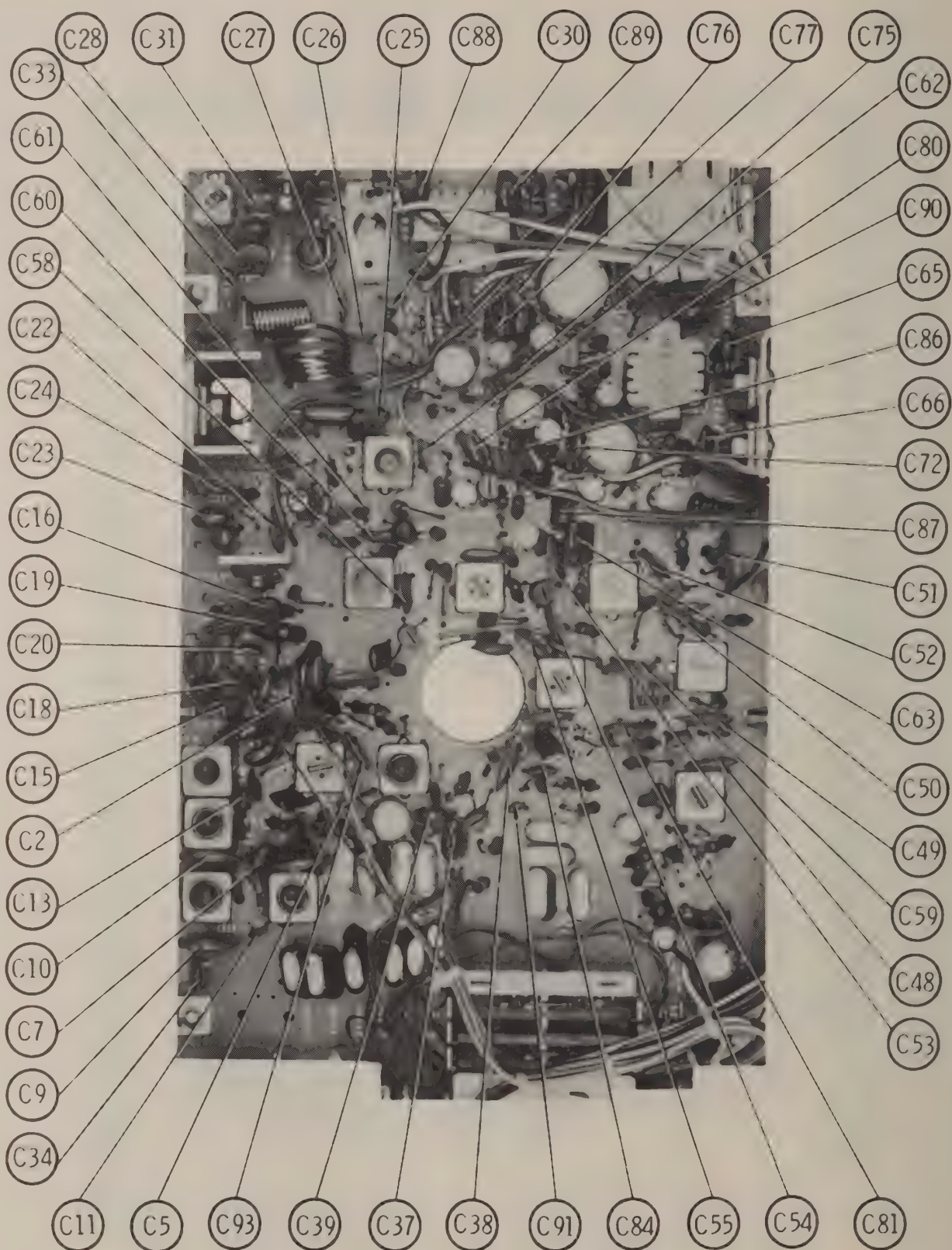
MAIN BOARD



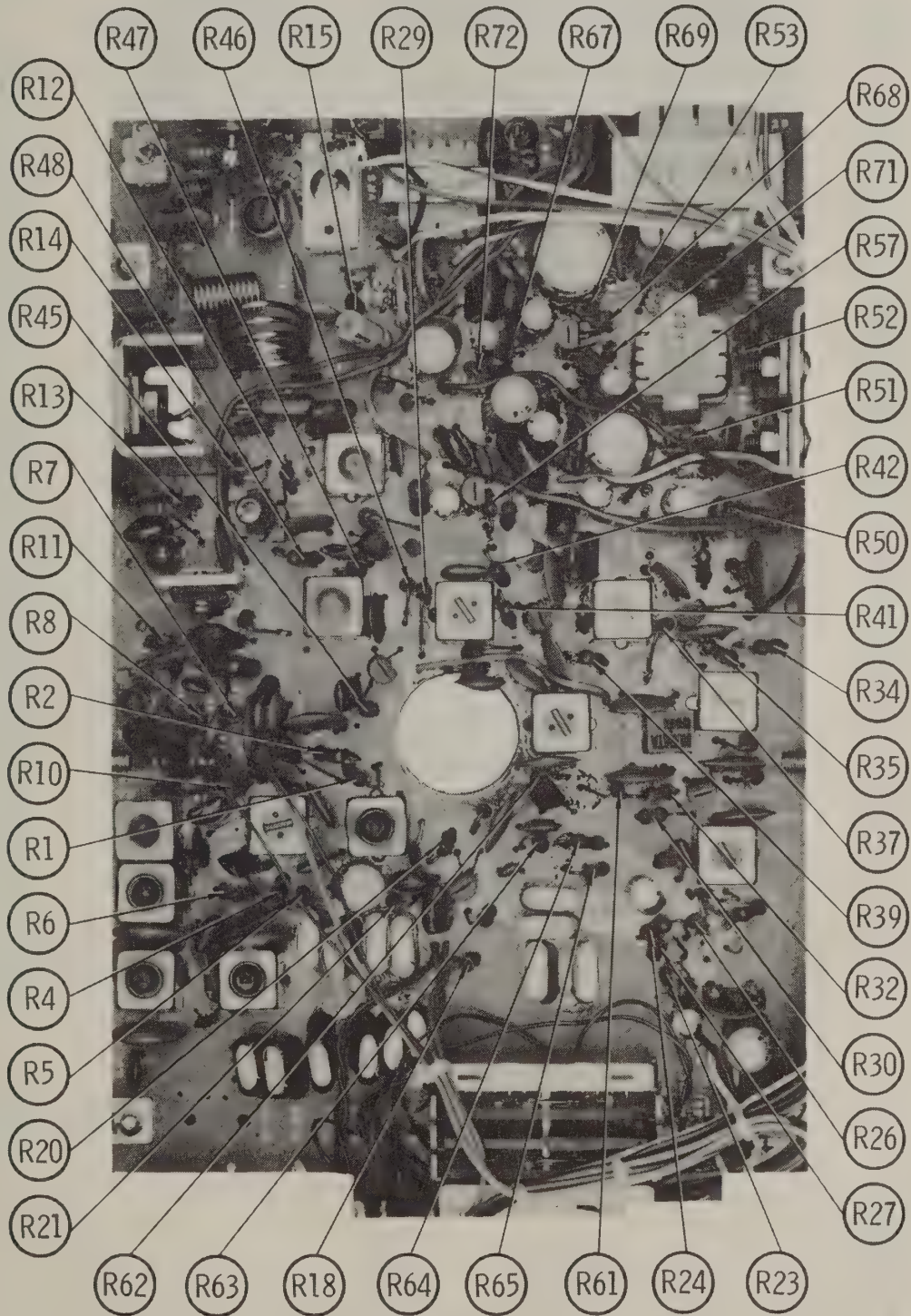
MAIN BOARD



MAIN BOARD



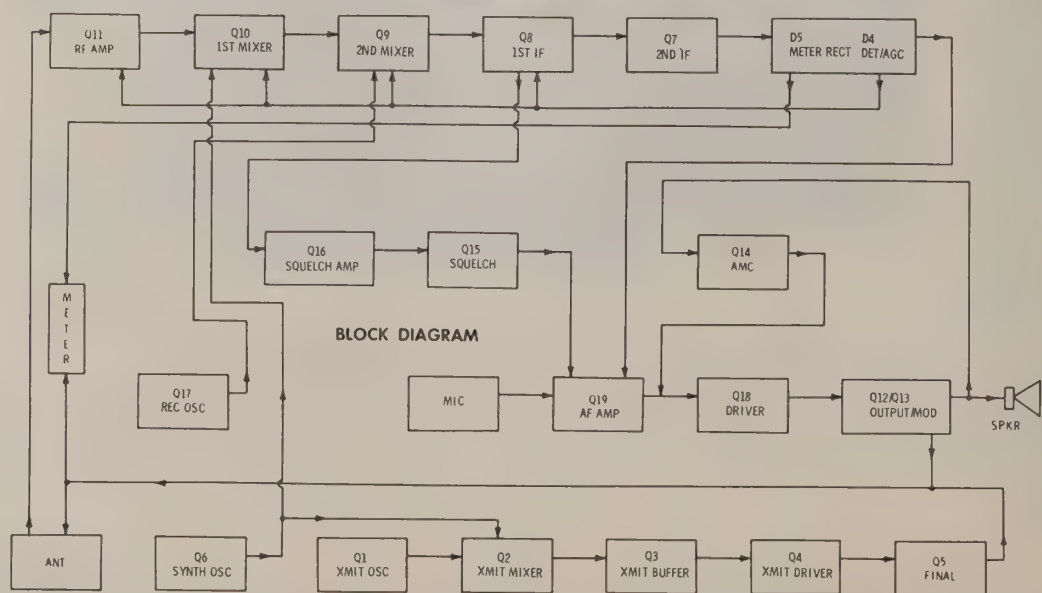
MAIN BOARD



MAIN BOARD



MAIN BOARD

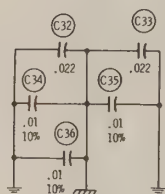
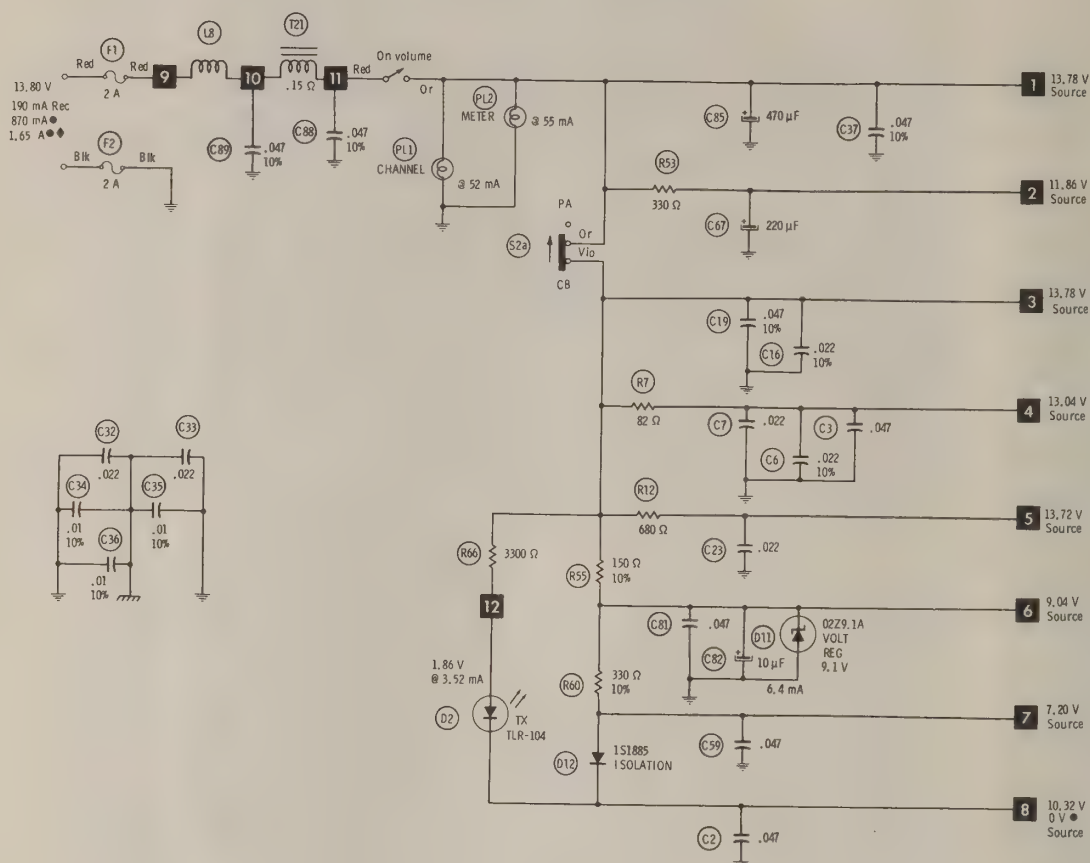


PARTS LIST AND DESCRIPTION

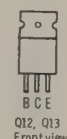
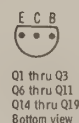
(When ordering parts, state Model, Part Number, and Description.)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D3	1S1555		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D4	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D5	1N60		1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D6	1S1555		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D7	1S1885		GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D8	1S1885		GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D9	1S1555		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D10	1S1555		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D11	02Z9.1A		GEZD-9.1		ZB9.1B		RE 114		RT-240	ECG139
D12	1S1885		GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
Q1	2SC1675	(1)	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
Q2	2SC394Y	(1)	GE-61 *	(IR)2SC372	PTC121 *	HEPS0014 *	RE 9	SK3018 *	RT-309	ECG229 *
Q3	2SC1675	(1)	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
Q4	2SC394Y	(1)	GE-61 *	(IR)2SC372	PTC121 *	HEPS0014 *	RE 9	SK3018 *	RT-309	ECG229 *
Q5	2SC815	(1)	GE-210 *	TR-21 *	PTC121 *	HEPS0015 *	RE 13 *	SK3038 *	RT-302	ECG123A *
Q6	2SC734Y	(1)	GE-212	TR-87 *	PTC123 *	HEPS5026 *	RE 17 *	SK3122	RT-302	ECG128 *
Q7	2SC1449	(10)	GE-270		PTC180		RE 209		RT-162	ECG295
Q8	2SC495T	(1)(11)	GE-270		PTC180		RE 209		RT-162	ECG295
Q9	2SC1306	(12)	GE-215	WEP1306	PTC186		RE 203	SK3197	RT-146	ECG235
Q10	2SC1678	(1)	GE-322	WEP1306	PTC186		RE 203	SK3197	RT-146	ECG235
Q11	2SC1675	(1)	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
Q12	2SC394Y	(1)	GE-61 *	(IR)2SC372	PTC121 *	HEPS0014 *	RE 9	SK3018 *	RT-309	ECG229 *
Q13	2SC945	(1)	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
Q14	2SC394Y	(1)	GE-61 *	(IR)2SC372	PTC121 *	HEPS0014 *	RE 9	SK3018 *	RT-309	ECG229 *
Q15	2SC945	(1)	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
Q16	2SC394Y	(1)	GE-61 *	(IR)2SC372	PTC121 *	HEPS0014 *	RE 9	SK3018 *	RT-309	ECG229 *
Q17	2SC1675	(1)	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
Q18	2SC784	(1)	GE-60 *	(IR)2SC380A0	PTC132 *	HEPS0008 *	RE 28 *	SK3018 *	RT-187	ECG229 *
Q19	2SC1675	(1)	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
Q20	2SC784	(1)	GE-60 *	(IR)2SC380A0	PTC132 *	HEPS0008 *	RE 28 *	SK3018 *	RT-187	ECG229 *
Q21	2SD325E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q22	2SD325E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q23	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q24	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q25	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q26	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q27	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q28	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q29	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q30	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q31	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q32	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q33	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q34	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q35	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q36	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q37	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q38	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q39	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q40	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q41	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q42	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q43	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q44	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q45	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q46	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q47	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q48	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q49	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q50	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q51	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q52	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q53	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q54	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q55	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q56	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q57	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q58	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q59	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q60	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q61	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q62	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q63	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q64	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q65	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q66	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q67	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q68	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q69	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q70	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q71	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q72	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q73	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q74	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q75	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q76	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q77	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q78	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q79	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q80	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q81	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q82	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q83	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q84	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q85	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q86	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q87	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q88	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q89	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q90	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q91	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q92	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q93	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q94	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q95	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q96	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q97	2SD328E	(13)	GE-28	WEP1096	PTC110	HEPS5027	RE 42	SK3197	RT-197	ECG186A
Q98	2SD328E	(13)	GE-28	WEP1096	PTC110					



Transistor Terminal Guide



—*— Circuitry not used in some versions

--- Circuitry used in some versions

⊕ See parts list

⊗ Nominal value

⊕ Ground

Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ◆ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

Value in () used in some versions.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE

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Chan	Crystal Complement
1	X1, X7, X11
2	X1, X8, X12
3	X1, X9, X13
4	X1, X10, X14
5	X2, X7, X11
6	X2, X8, X12
7	X2, X9, X13
8	X2, X10, X14
9	X3, X7, X11
10	X3, X8, X12
11	X3, X9, X13
12	X3, X10, X14
13	X4, X7, X11
14	X4, X8, X12
15	X4, X9, X13
16	X4, X10, X14
17	X5, X7, X11
18	X5, X8, X12
19	X5, X9, X13
20	X5, X10, X14
21	X6, X7, X11
22	X6, X8, X12
23	X6, X10, X14

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
RV1	RF Meter	50K		T-50K (2)	C-503 (2)	MTC54L1 (2)	X201R503B (2)
RV2	S Meter	10K		T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
RV3	Volume/Switch	10K					
RV4	Squelch	10K					
RV5	AMC	10K					

(2) Cut off one of the end terminals and bend to fit PC board.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke				
L2	RF Choke				
L3	Ant. Load				
L4	Pi Filter				
L5	Pi Filter (27MHz)				
L6	TVI Trap				
L8	RF Choke				
T1	Xmit Osc (10MHz)				
T2	Xmit Mixer (27MHz)				
T3	Harmonic Suppressor (27MHz)				
T4	Harmonic Suppressor (27MHz)				
T5	Xmit Mixer (27MHz)				
T6	Xmit Buffer (27MHz)				
T7	Xmit Driver (27MHz)				
T11	Rec Antenna (27MHz)				
T12	Rec RF (27MHz)				
T13	IF (10MHz)				
T14	Rec Osc (10MHz)				
T15	IF (455kHz)				
T16	IF (455kHz)				
T17	IF (455kHz)				
T18	Synth Osc (37MHz)				

FILTER CHOKE

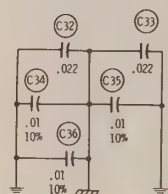
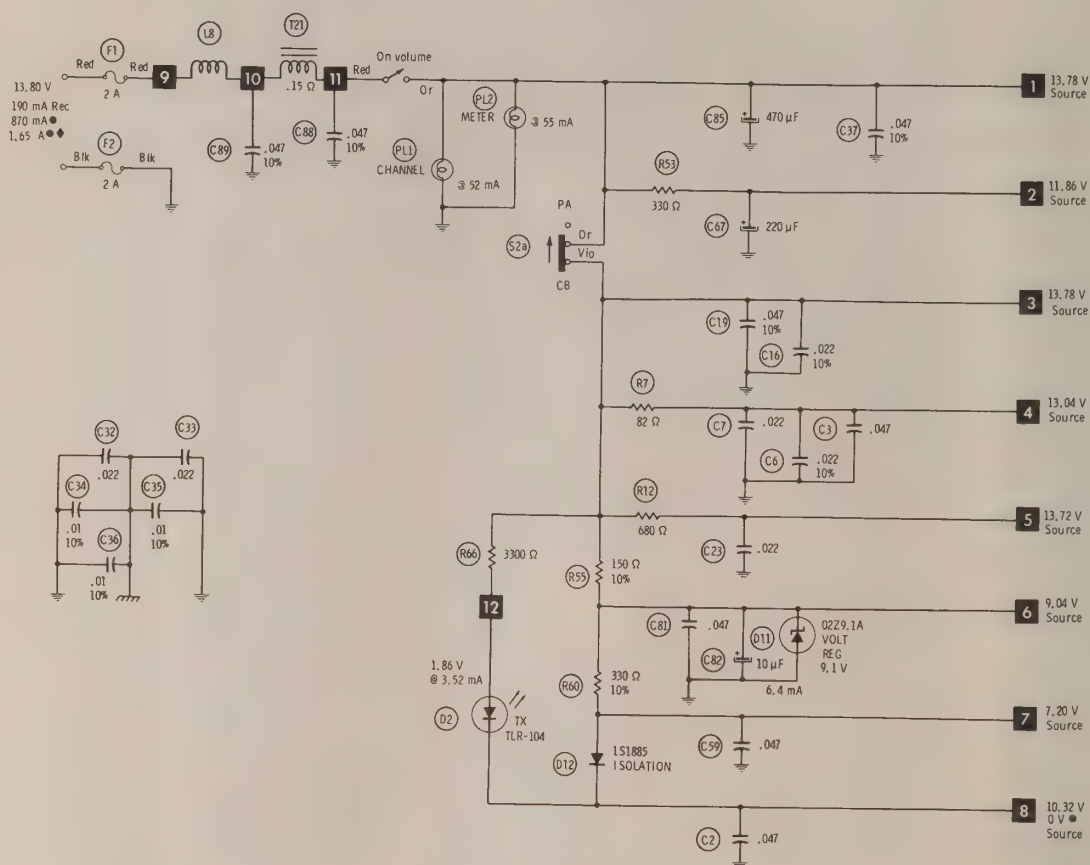
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T21	1.65 A	.15	.28mH	W60-403 (1)			(1) Number on unit.

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T19	2.2	1		W60-402 (1)			(1) Number on Unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE			REPLACEMENT DATA			NOTES
	PRI.	SEC.		MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T20	38	1 8	2 23	W60-401 (1)			(1) Number on unit.



Transistor Terminal Guide



Q1 thru Q3
Q6 thru Q11
Q14 thru Q19
Bottom view



Front view



Front view



Q12, Q13
Front view

—*— Circuitry not used in some versions

--- Circuitry used in some versions

⊕ See parts list

※ Nominal value

⊥ Ground

Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ◆ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

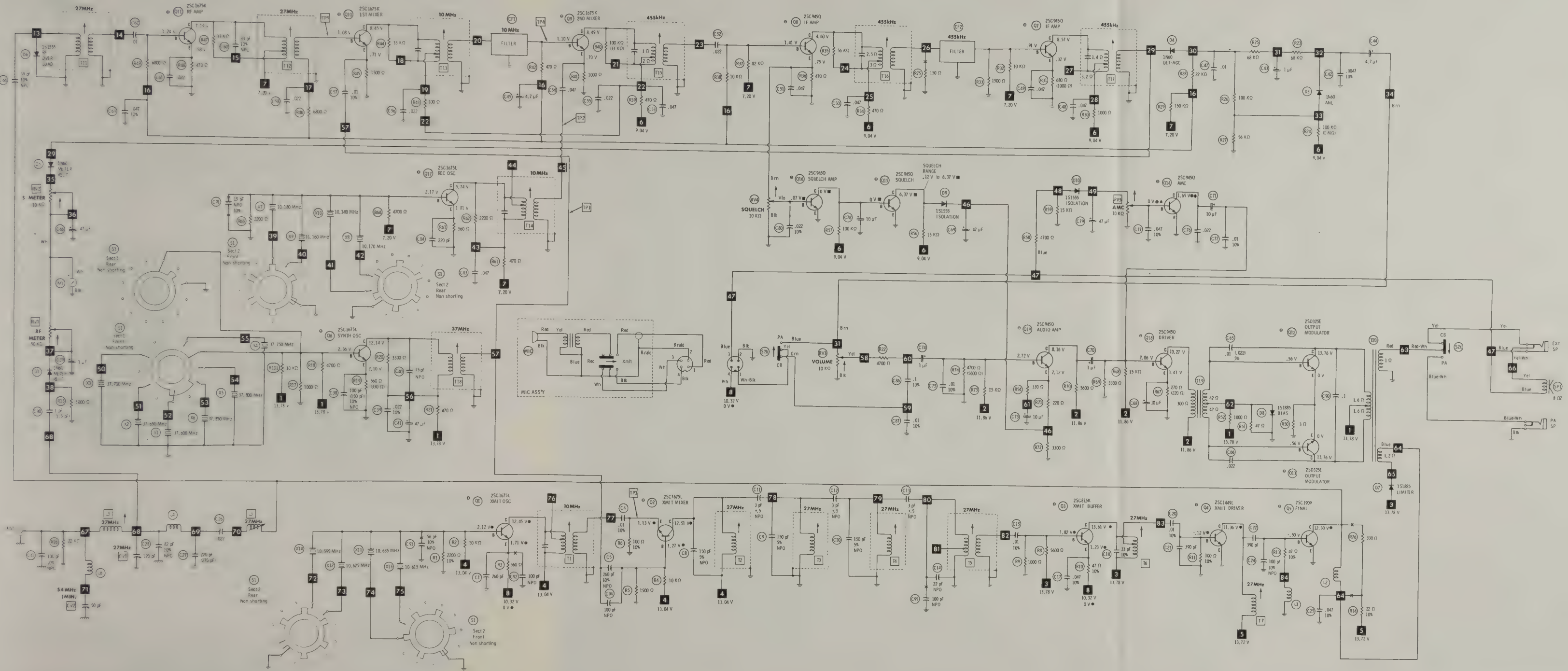
Value in () used in some versions.

A PHOTOFACIT STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE

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Chan	Crystal Complement
1	X1, X7, X11
2	X1, X8, X12
3	X1, X9, X13
4	X1, X10, X14
5	X2, X7, X11
6	X2, X8, X12
7	X2, X9, X13
8	X2, X10, X14
9	X3, X7, X11
10	X3, X8, X12
11	X3, X9, X13
12	X3, X10, X14
13	X4, X7, X11
14	X4, X8, X12
15	X4, X9, X13
16	X4, X10, X14
17	X5, X7, X11
18	X5, X8, X12
19	X5, X9, X13
20	X5, X10, X14
21	X6, X7, X11
22	X6, X8, X12
23	X6, X10, X14



PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3" PM 8 ohms		30A05Z8R	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2 Amp			AGC2	HDJ	312002	150145	FG2-2
F2	2 Amp			AGC2	HDJ	312002	150145	FG2-2

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIC		18-032	18-034	18-010	18-092	1	2	4	3	NC	2

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	37.600		DA14W37600	1,2,3,4	X10	10.140		DC14W10140	4,8,12,16,20,23
X2	37.650		DA14W37650	5,6,7,8	X11	10.635		DB60W10635(1)	1,5,9,13,17,21
X3	37.700		DA14W37700	9,10,11,12				DB20W10635(2)	
X4	37.750		DA14W37750	13,14,15,16	X12	10.625		DB60W10625(1)	2,6,10,14,18,22
X5	37.800		DA14W37800	17,18,19,20				DB20W10625(2)	
X6	37.850		DA14W37850	21,22,23	X13	10.615		DB60W10615(1)	3,7,11,15,19
X7	10.180		DC14W10180	1,5,9,13,17,21				DB20W10615(2)	
X8	10.170		DC14W10170	2,6,10,14,18,22	X14	10.595		DB60W10595(1)	4,8,12,16,20,23
X9	10.160		DC14W10160	3,7,11,15,19				DB20W10595(2)	

(1) Use when C93 56pF is used in Xmit Oscillator.

(2) Use when C93 is not used in Xmit Oscillator.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Filter		10MHz
CF2	Filter		455kHz
D2	Led		Transmit Indicator
M1	Meter		S/Rf
S1	Switch		Channel Selector
S2	Switch		PA/CB
	Printed Circuit Board		Main (W60-101)

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors
	8524 (Stranded) Available in 13 Colors
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type)
	8237 Low-loss (RG-8/U)
	8240 (Solid) Miniature (RG-58/U)
	8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL Tomcat 23B

PEARCE-SIMPSON MODEL TOMCAT 23B

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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Printed in U. S. of America

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PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	260		DD-271	GP270	GP327		10TS-T27
C2	.047		UK12-503		MAG1215		HY-350
C3	.047		UK12-503		MAG1215		HY-350
C4	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C5	260		DD-271	GP270	GP327		10TS-T27
C6	.022			WMF1S12	EWFA1112		1PB-S12
C7	.022			WMF1S12	EWFA1112		1PB-S12
C8	150 NPO		DTZ-150		CN0315		10TCC-T15
C9	150 NPO		DTZ-150		CN0315		10TCC-T15
C10	150 NPO		DTZ-150		CN0315		10TCC-T15
C11	3 NPO		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C12	3 NPO		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C13	3 NPO		DTZ-3R3	NP03P3	CN0533		10TCC-V33
C14	22 NPO		DTZ-22	NP022	CN0422		10TCC-Q22
C15	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C16	.022			WMF1S12	EWFA1112		1PB-S12
C17	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C18	33 NPO		DTZ-33	NP033	CN0433		10TCC-Q33
C19	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C20	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C21	390		DD-391	GP390	GP339		10TS-T39
C22	390		DD-391	GP390	GP339		10TS-T39
C23	.022			WMF1S12	EWFA1112		1PB-S12
C24	100 NPO		DTZ-100	NP0100	CN0310		10TCC-T10
C25	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C26	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C27	220		DD-221		GP322		10TS-T22
C28	82 NPO		DTZ-82	NP082	CN0482		10TCC-Q82
C30	1 NPO				CN0510		10TCC-V10
C31	100 NPO		DTZ-100	NP0100	CN0310		10TCC-T10
C32	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C33	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C34	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C35	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C36	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C37	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C38	100 NPO		DTZ-100	NP0100	CN0310		10TCC-T10
C39	.022			WMF1S12	EWFA1112		1PB-S12
C40	15 NPO		DTZ-15	NP015	CN0415		10TCC-Q15
C42	.0047			WMF1D47	EWFA247	QF1-57	1PB-D47
C47	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C48	.047		UK12-503		MAG1215		HY-350
C49	.047		UK12-503		MAG1215		HY-350
C50	.047		UK12-503		MAG1215		HY-350
C51	.047		UK12-503		MAG1215		HY-350
C52	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C53	.047		UK12-503		MAG1215		HY-350
C54	.047		UK12-503		MAG1215		HY-350
C55	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C56	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C57	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C58	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C59	.047		UK12-503		MAG1215		HY-350
C60	33 NPO		DTZ-33	NP033	CN0433		10TCC-Q33
C61	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C62	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C63	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C64	39 NPO				CN0439		10TCC-Q39
C65	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C66	.022			WMF1S12	EWFA1112		1PB-S12
C72	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C75	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C76	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C77	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C80	.022			WMF1S12	EWFA1112		1PB-S12
C81	.047		UK12-503		MAG1215		HY-350
C83	.047		UK12-503		MAG1215		HY-350
C84	220		DD-221		GP322		10TS-T22
C86	.1			DPMS2P1	EWFA010	QF1-215	1PB-P10
C87	.01			WMF1S1	EWFA1110	QF1-91	1PB-S10
C88	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C89	.047			DPMS2S47	EWFA147	QF1-171	1PB-S47
C90	.1			DPMS2P1	EWFA010	QF1-215	1PB-P10
C91	15 NPO		DTZ-15	NP015	CN0415		10TCC-Q15
C92	100 NPO		DTZ-100	NP0100	CN0310		10TCC-T10
C93	56 NPO				CN0456		10TCC-Q56
C94	100 NPO		DTZ-100	NP0100	CN0310		10TCC-T10
C95	100 NPO		DTZ-100	NP0100	CN0310		10TCC-T10
CV1	120						
CV2	50						

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
RV1	RF Meter	50K		T-50K (2)	C-503 (2)	MTCS4L1 (2)	X201R503B (2)
RV2	S Meter	10K		T-10K (2)	C-103 (2)	MTCT4L1 (2)	X201R103B (2)
RV3	Volume/Switch	10K					
RV4	Squelch	10K					
RV5	AMC	10K					

(2) Cut off one of the end terminals and bend to fit PC board.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke				
L2	RF Choke				
L3	Ant. Load				
L4	Pi Filter				
L5	Pi Filter (27MHz)				
L6	TVI Trap				
L8	RF Choke				
T1	Xmit Osc (10MHz)				
T2	Xmit Mixer (27MHz)				
T3	Harmonic Suppressor (27MHz)				
T4	Harmonic Suppressor (27MHz)				
T5	Xmit Mixer (27MHz)				
T6	Xmit Buffer (27MHz)				
T7	Xmit Driver (27MHz)				
T11	Rec Antenna (27MHz)				
T12	Rec RF (27MHz)				
T13	IF (10MHz)				
T14	Rec Osc (10MHz)				
T15	IF (455kHz)				
T16	IF (455kHz)				
T17	IF (455kHz)				
T18	Synth Osc (37MHz)				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T21	1.65 A	.15	.20mH	W60-403 (1)			(1) Number on unit.

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T19	2.2	1		W60-402 (1)			(1) Number on Unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE			REPLACEMENT DATA			NOTES
	PRI.	SEC.		MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T20	38	1 8	2 23	W60-401 (1)			(1) Number on unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP1	3" PH 8 ohms		30A0528R	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA							
		PART No.		BUSS PART No.		LITTELFUSE * PART No.		WORKMAN PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	DEVICE
F1	2 Amp			AGC2	HDJ	312002	150145	F62-2	
F2	2 Amp			AGC2	HDJ	312002	150145	F62-2	

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Green
MIC		18-032	18-034	18-010	18-092	1	2	4	3	NC	2

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHZ	MFR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHZ	MFR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	37.600		DA14W37600	1,2,3,4	X10	10.140		DC14W10140	4,8,12,16,20,23
X2	37.650		DA14W37650	5,6,7,8	X11	10.635		DB60W10635(1)	1,5,9,13,17,21
X3	37.700		DA14W37700	9,10,11,12				DB20W10635(2)	
X4	37.750		DA14W37750	13,14,15,16	X12	10.625		DB60W10625(1)	2,6,10,14,18,22
X5	37.800		DA14W37800	17,18,19,20				DB20W10625(2)	
X6	37.850		DA14W37850	21,22,23	X13	10.615		DB60W10615(1)	3,7,11,15,19
X7	10.180		DC14W10180	1,5,9,13,17,21				DB20W10615(2)	
X8	10.170		DC14W10170	2,6,10,14,18,22	X14	10.595		DB60W10595(1)	4,8,12,16,20,23
X9	10.160		DC14W10160	3,7,11,15,19				DB20W10595(2)	

(1) Use when C93 56pF is used in Xmit Oscillator.

(2) Use when C93 is not used in Xmit Oscillator.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Filter		10MHz
CF2	Filter		455kHz
D2	Led		Transmit Indicator
M1	Meter		S/R
S1	Switch		Channel Selector
S2	Switch		PA/CB
	Printed Circuit Board		Main (W60-101)

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors
Shielded Antenna Lead	Use BELDEN No. 8524 (Stranded) Available in 13 Colors
	8524 Lowest-loss (RG-8/U Type)
	8237 Low-loss (RG-8/U)
	8240 (Solid) Miniature (RG-58/U)
	8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL Tomcat 23B

PEARCE-SIMPSON MODEL TOMCAT 23B

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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Printed in U. S. of America

7CY483

ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period.
Adjustments made with 13.8-volt DC input.
Connect low sides of test equipment to ground unless specified otherwise.
Connect 50-ohm dummy load or antenna before keying transmitter.
Suggested Alignment Tools: GC ELECTRONICS:
L1, L2, L9, T3, T4, T5, T10..... 5009
L6, L8, L10 9304
L4, T1, T2, T8, T9 9440
VC1 5000

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of frequency counter to TP10.	Ch. 13 Ch. 17 Ch. 21 Ch. 1 Ch. 5 Ch. 9		Check for 17.115MHz. Check for 17.165MHz. Check for 17.215MHz. Check for 16.965MHz. Check for 17.015MHz. Check for 17.065MHz.
Input of frequency counter to TP11.	Ch. 13 Ch. 14 Ch. 15 Ch. 16		Check for 9.545MHz. Check for 9.555MHz. Check for 9.565MHz. Check for 9.585MHz.
Input of frequency counter to TP12.	Ch. 13, Xmit Ch. 14, Xmit Ch. 15, Xmit Ch. 16, Xmit		Check for 10.000MHz. Check for 10.010MHz. Check for 10.020MHz. Check for 10.040MHz.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Set generator output low enough to prevent AGC limiting.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP2. 455kHz, 1000Hz @ 30% modulation.	Ch. 13	T5, T4, T3	Adjust for maximum output.
Output of signal generator thru .01uF to TP1. 10MHz, 1000Hz @ 30% modulation.	Ch. 13	L2, L1	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation.	Ch. 13	T2, T1, L9	Adjust for maximum output. Repeat above steps, if necessary.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 300uV.	Ch. 13	VR3	SQUELCH RANGE Set squelch control VR2 fully clockwise. Adjust VR3 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 13	VR5	S METER Adjust VR5 for 9 on S scale of meter.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter. See page 4 for channel frequencies.

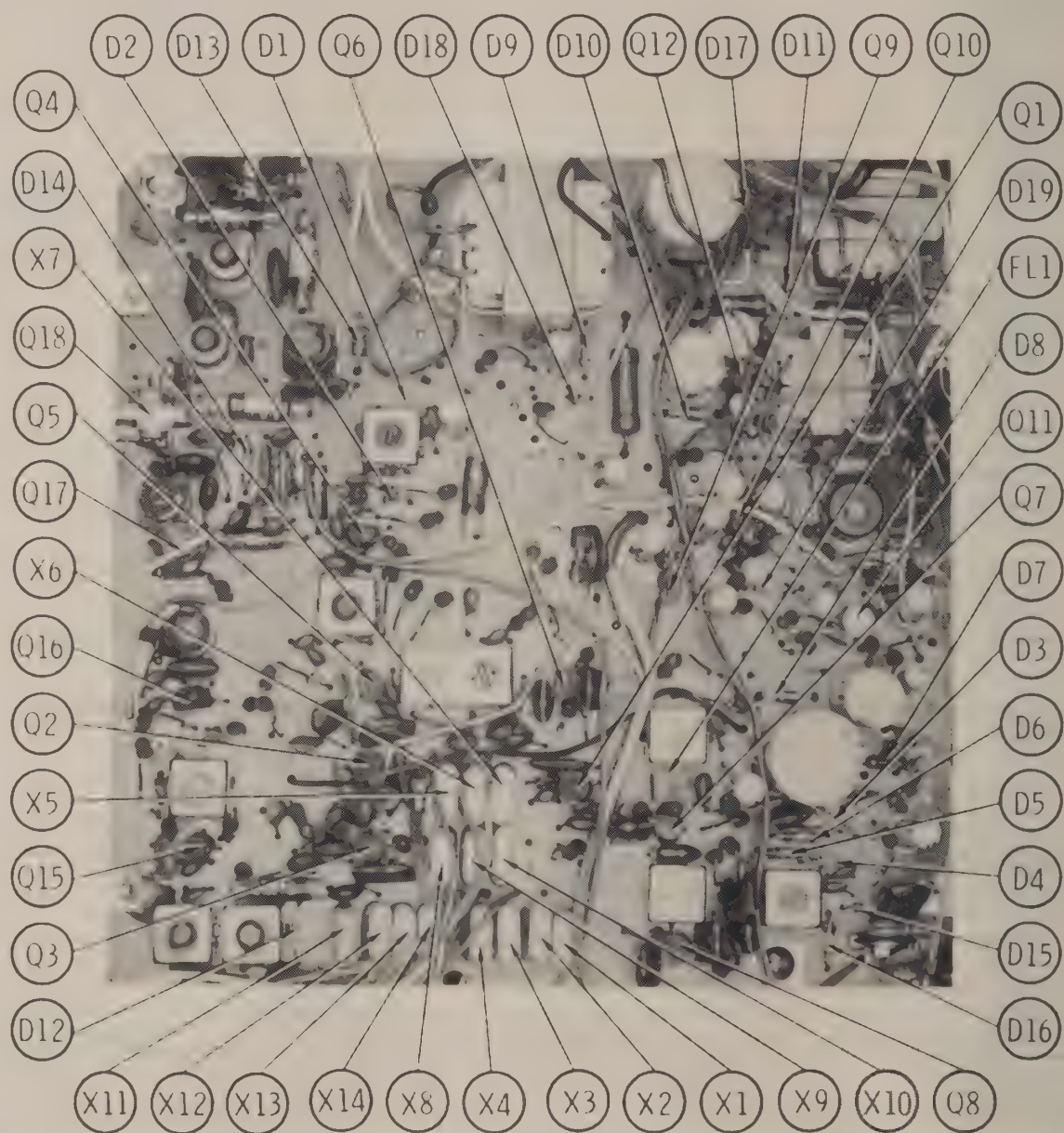
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of spectrum analyzer to antenna jack.	Ch. 13	L4, T8, T9, T10, L6, L8, L10	Adjust for maximum.
	Ch. 13	L10, L8	Adjust for 4 watts maximum.
	Ch. 13	VC1	Adjust for MINIMUM at 54MHz.

TRANSMITTER ADJUSTMENTS

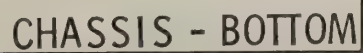
Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

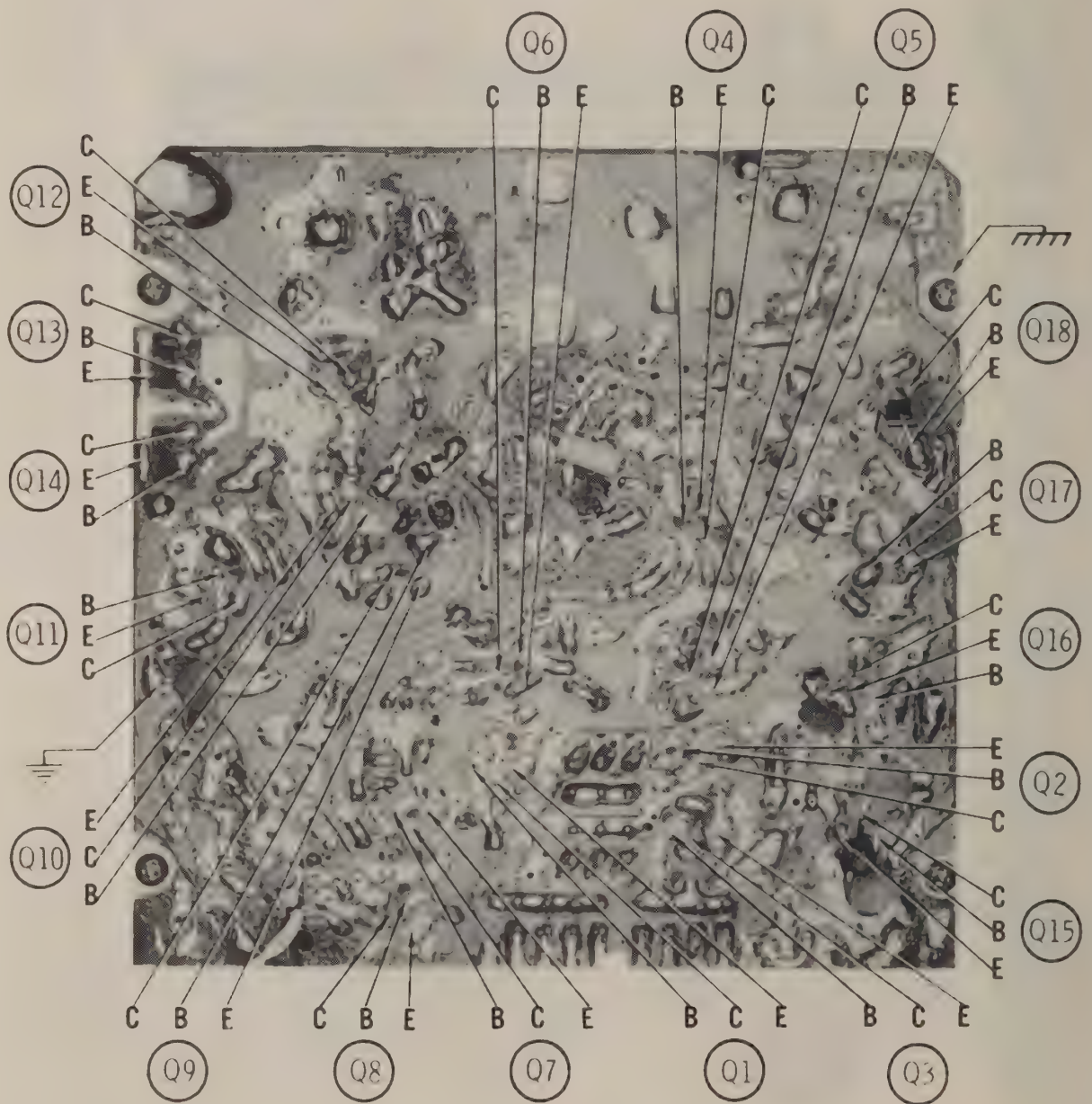
NOTE: Be sure to check transmit frequency and power on all active channels after adjustments of transmitter. See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Modulation meter to antenna jack. Inject a 1000Hz signal at Mic input.	Ch. 13	VR4	AMC Disconnect C50 to disable AMC. Adjust signal for over-modulation. Restore AMC operation. Adjust VR4 for 100% modulation maximum.
	Ch. 13	VR6	RF PANEL METER Adjust VR6 so that RF Panel Meter agrees with RF wattmeter.

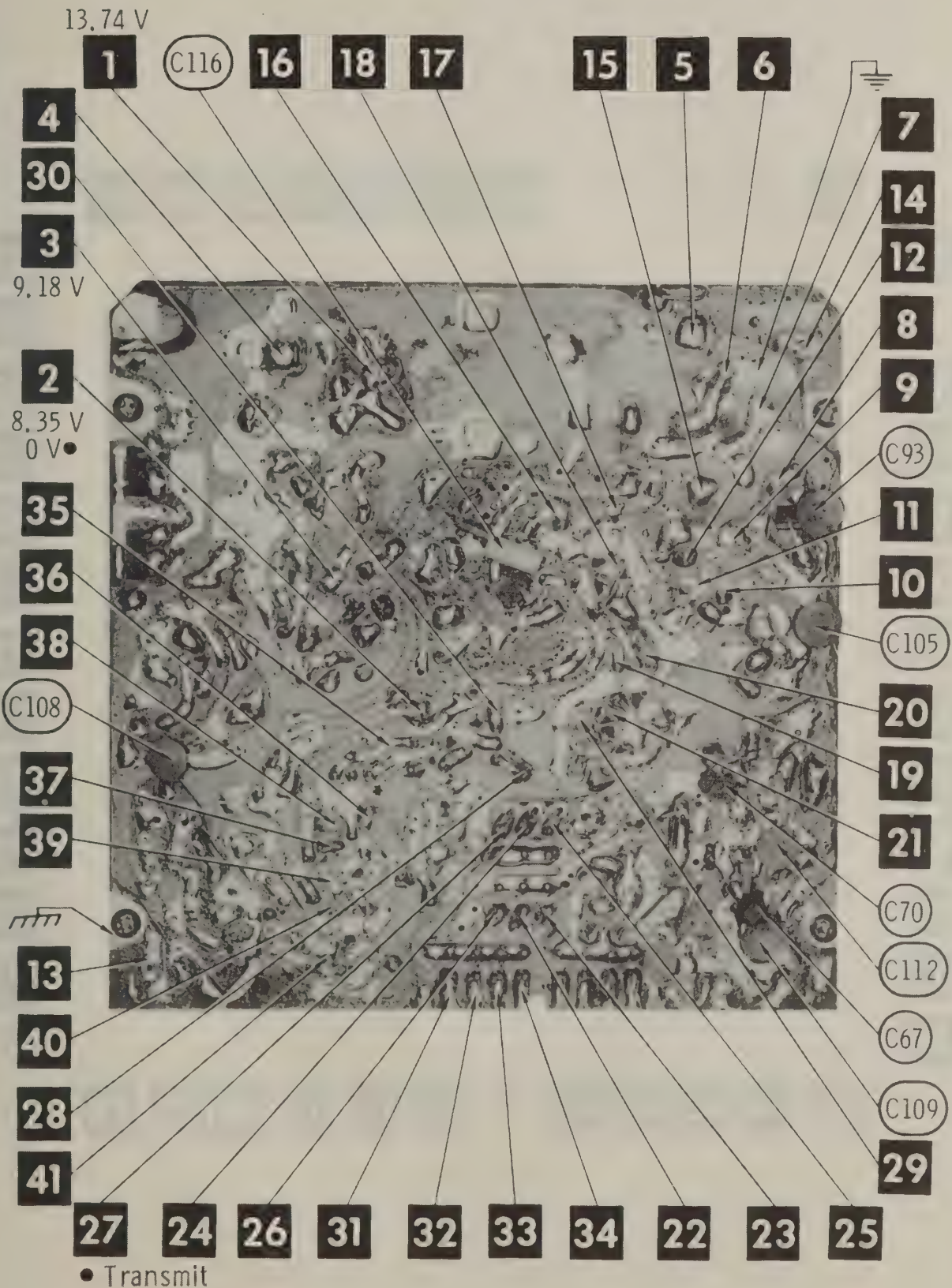


MAIN BOARD





MAIN BOARD



PEARCE-SIMPSON MODEL TOMCAT 23B

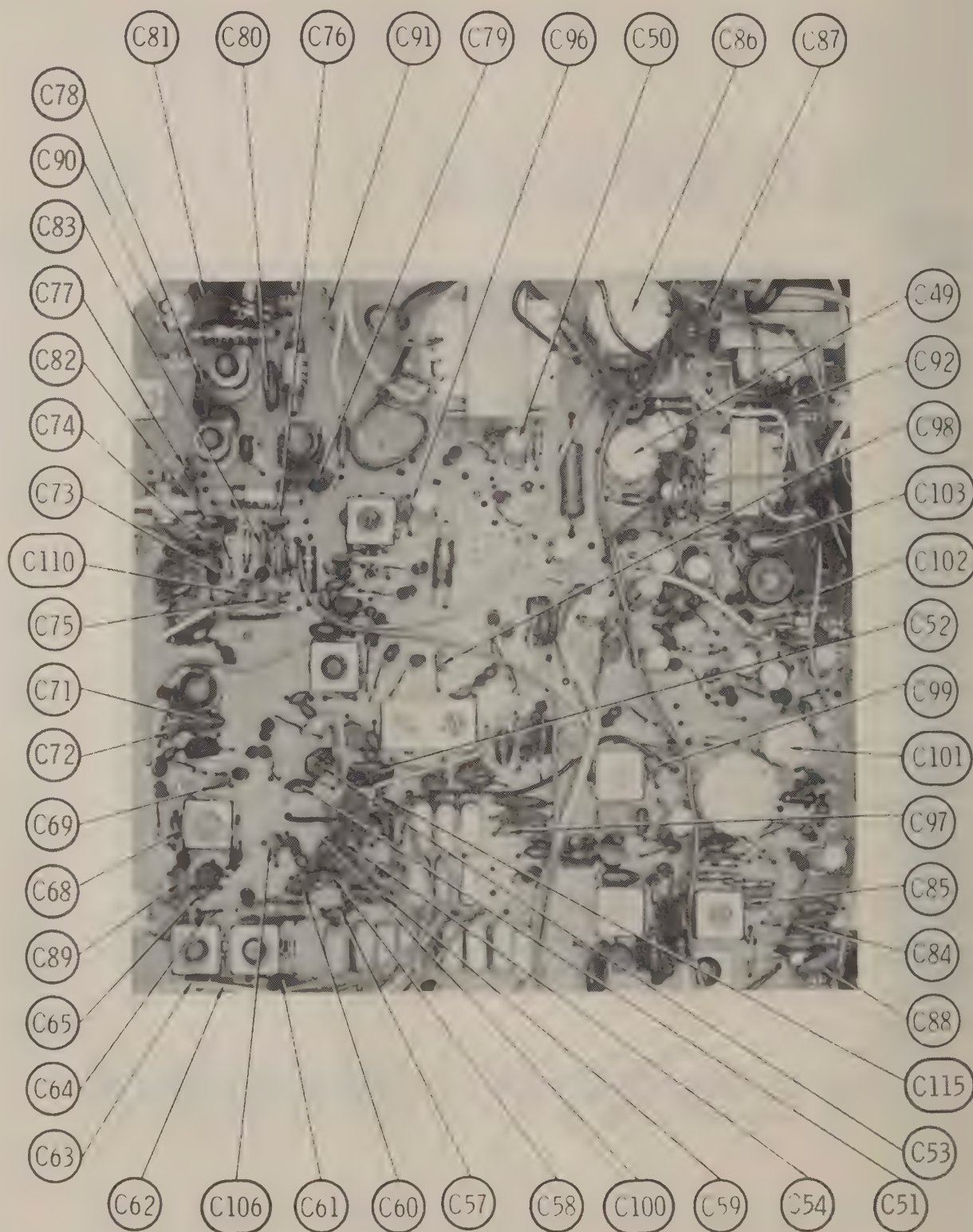
MAIN BOARD



MAIN BOARD



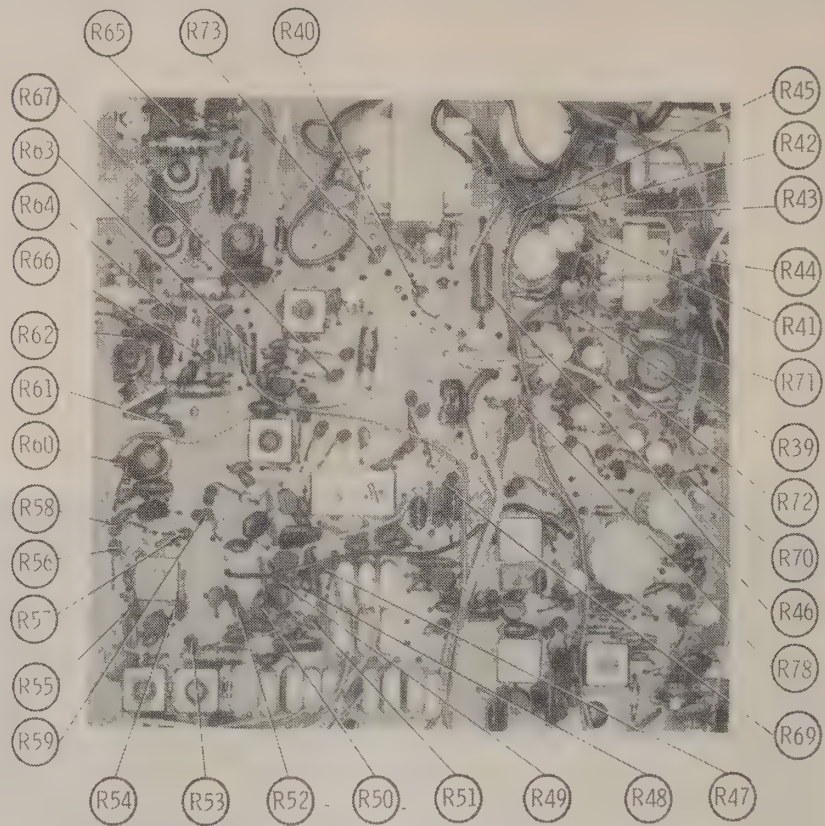
MAIN BOARD



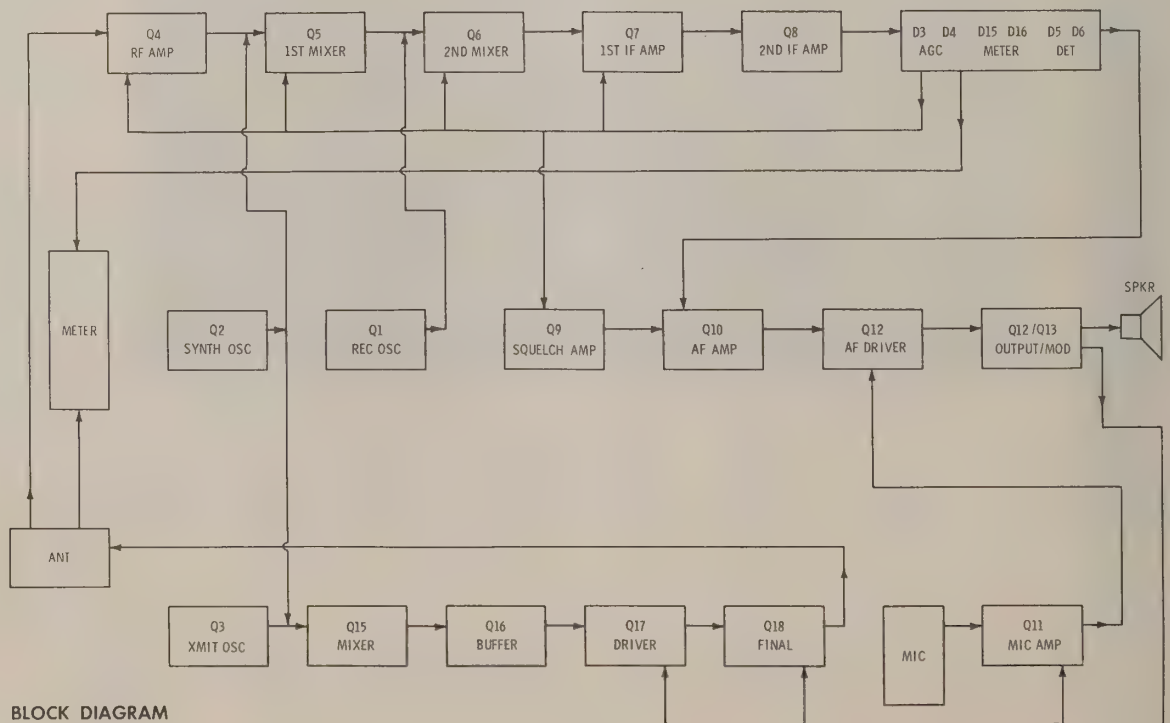
MAIN BOARD



MAIN BOARD



MAIN BOARD



BLOCK DIAGRAM

PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors 8524 (Stranded) Available in 13 Colors
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene

SEMICONDUCTORS (Select replacement transistor for best results)

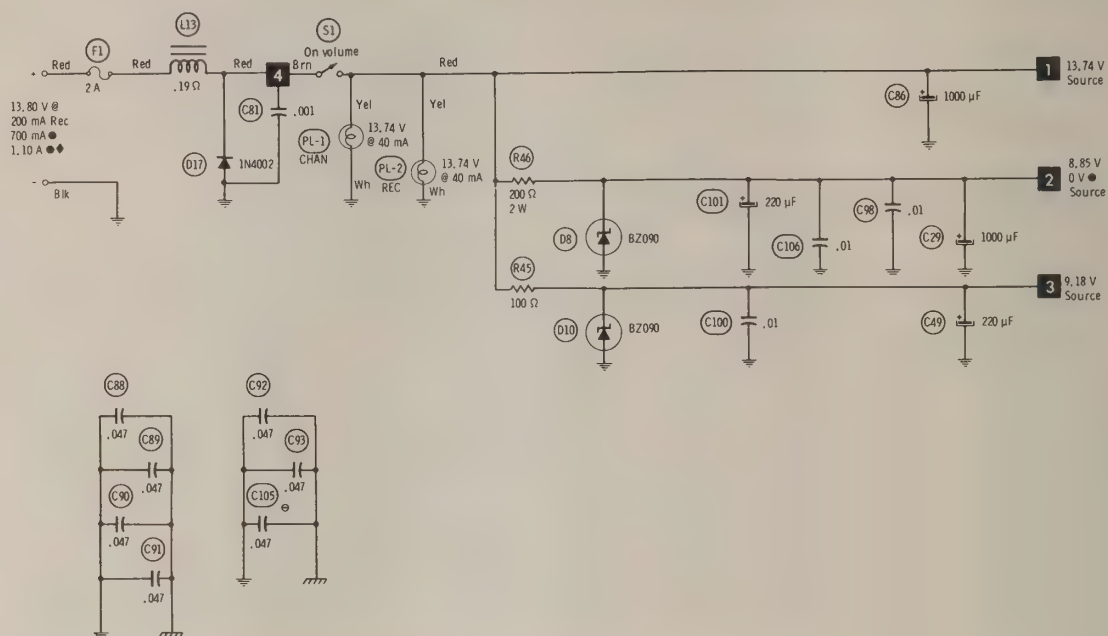
ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	WG713	5001-107	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
	WG1012	5001-107(1)	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D2	1N60FM	5001-141	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D4	1N60FM	5001-141	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D5	1N60FM	5001-141	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D6	1N60FM	5001-141	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D7	1S84	5001-164	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D8	BZ090	5001-125	GEZD-9.1		ZB9.1B		RE 114		RT-240	ECG139
D9	1N60FM	5001-141	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D10	BZ090	5001-125	GEZD-9.1		ZB9.1B		RE 114		RT-240	ECG139
D11	1S1211	5001-112			PTC301					
D12	1S2473	5001-128	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D13	1N4002	5001-163	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D14	1N60FM	5001-141	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D15	1N60FM	5001-141	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D16	1N60FM	5001-141	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D17	1N4002	5001-163	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D18	VD1211	5001-165			PTC301					
Q1	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q2	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q3	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q4	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q5	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q6	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q7	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q8	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q9	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
	2SC711	5001-043(1)	GE-62 *	(IR)2SC644	PTC121	HEPS0024 *	RE 192 *	SK3124 *	RT-302 *	ECG199 *
Q10	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
	2SC711	5001-043(1)	GE-62 *	(IR)2SC644	PTC121	HEPS0024 *	RE 192 *	SK3124 *	RT-302 *	ECG199 *
Q11	2SD187		GE-59	TR-08	PTC134	HEPG6011	RE 6	SK3010	RT-119	ECG103A *
	2SD77B	5001-512(1)	GE-59	WEP641B			RE 6		RT-129	ECG103A *
Q12	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
	2SC711	5001-043(1)	GE-62 *	(IR)2SC644	PTC121	HEPS0024 *	RE 192 *	SK3124 *	RT-302 *	ECG199 *
Q13	2SC1014	5001-010	GE-273	WEP1014	PTC193		RE 213		RT-137	ECG300
Q14	2SC1014	5001-010	GE-273	WEP1014	PTC193		RE 213		RT-137	ECG300
Q15	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q16	2SC710	5001-002	GE-211 *	(IR)2SC710	PTC115	HEPS0016 *	RE 13 *	SK3018 *	RT-308 *	ECG123A *
Q17	2SC495T	5001-513		WEP913	PTC180		RE 209		RT-162	ECG295
Q18	2SC1678	5001-514	GE-20	TR-24	PTC136	HEPS0033	RE 13	SK3124	RT-102	ECG123A

* Lead Configuration may vary from original.

(1) Used in some versions.

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C2	10 16V		PC10-25	VTT10A25	QV1-41	EV-1222
C25	10 16V		PC10-25	VTT10A25	QV1-41	EV-1222
C27	2.2 50V		PC2-100	VTT2R2A50	QV1-19	EV-1517
C29	1000 16V		PC1000-16	VTT1000L16	QV1-183	EV-1260
C36	4.7 25V		PC5-50	VTT4R7A50	QV1-27	EV-1319
C37	1 50V		PC1-50	VTT1B63	QV1-11	EV-1615
C39	1 50V		PC1-50	VTT1B63	QV1-11	EV-1615
C40	10 16V		PC10-25	VTT10A25	QV1-41	EV-1222
C41	.47 16V		PC1-50	VTT4R7B63	QV1-3	EV-1610
C43	4.7 25V		PC5-50	VTT4R7A50	QV1-27	EV-1319
C44	10 16V		PC10-25	VTT10A25	QV1-41	EV-1222
C45	1 50V		PC1-50	VTT1B63	QV1-11	EV-1615
C46	1 50V		PC1-50	VTT1B63	QV1-11	EV-1615
C47	.47 16V		PC1-50	VTT4R7B63	QV1-3	EV-1610
C48	100 16V		PC100-16	VTT100F16	QV1-95	EV-1230
C49	220 16V		PC250-25	VTT220G16	QV1-117	EV-1240
C50	4.7 25V		PC5-50	VTT4R7A50	QV1-27	EV-1319
C86	1000 16V		PC1000-16	VTT1000L16	QV1-183	EV-1260
C101	220 16V		PC250-25	VTT220G16	QV1-117	EV-1240
C116	10 16V		PC10-25	VTT10A25	QV1-41	EV-1222



Terminal Guides



Q1 thru Q10
Q12, Q15, Q16
Bottom view



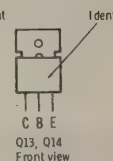
Q11
Bottom view



Q18
Front view



Q17
Front view



Q13, Q14
Front view

—X— Circuitry not used in some versions

--- Circuitry used in some versions

⊖ See parts list

✱ Nominal value

⊥ Ground

⏏ Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ◆ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

Resistors are 1/2 W or less, 5% unless noted.

Value in () used in some versions.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

WITH **CIRCUITRACE**

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Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X5, X1, X11	7	X6, X3, X13	13	X8, X1, X11	19	X9, X3, X13
2	X5, X2, X12	8	X6, X4, X14	14	X8, X2, X12	20	X9, X4, X14
3	X5, X3, X13	9	X7, X1, X11	15	X8, X3, X13	21	X10, X1, X11
4	X5, X4, X14	10	X7, X2, X12	16	X8, X4, X14	22	X10, X2, X12
5	X6, X1, X11	11	X7, X3, X13	17	X9, X1, X11	23	X10, X3, X13
6	X6, X2, X12	12	X7, X4, X14	18	X9, X2, X12	24	X10, X4, X14

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFGR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	Volume/Switch	10K	5008-089				
VR2	Squelch	10K	5008-088				
VR3	Squelch Range	10K	5008-007	T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
VR4	AMC	10K	5008-007	T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
VR5	S Meter	50K	5008-032	T-50K (2)	C-503 (2)	MTC54L1 (2)	X201R503B (2)
VR6	RF Meter	100K	5008-031	T-100K (2)	C-104 (2)	MTC15L1 (2)	X201R104B (2)

(2) Cut off one of the end terminals and bend to fit PC board.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Rec. Mixer (10MHz)	5006-291	42K-10		
L2	Rec. Mixer (10MHz)	5006-291	42K-10		
L3	RF Choke (22uH)	5006-288			
L4	Harmonic Suppressor (27MHz)	5006-297	507Y1		
L5	RF Choke	5006-287			
L6	Xmit Driver (27MHz)	5006-296	S-18		
L7	RF Choke (.65uH)	5006-285			
L8	Final Amp	5070-295	S-18		
L9	Rec. Antenna	5006-302	Z343QD		
L10	Antenna Match (27MHz)	5070-295	S-18		
L11	RF Choke (.22uH)	5006-284			
L12	RF Choke (.85uH)	5006-286			
		5007-044	K-10		
L14	RF Choke (22uH)	5006-288			
L16	RF Choke	5006-289	K-58		
T1	Rec Antenna (27MHz)	5006-301	C294DD		
T2	Rec RF (27MHz)	5006-300	C377BD		
T3	IF (455kHz)	5006-294	A086AD		
T4	IF (455kHz)	5006-293	E1A227B		
T5	IF (455kHz)	5006-292	E1A146D		
T8	Xmit Osc (27MHz)	5006-298	507S311		
T9	Xmit Mixer (27MHz)	5006-299	C305BD		
T10	Xmit Buffer (27MHz)	5006-303	C042DD		

FILTER CHOKE

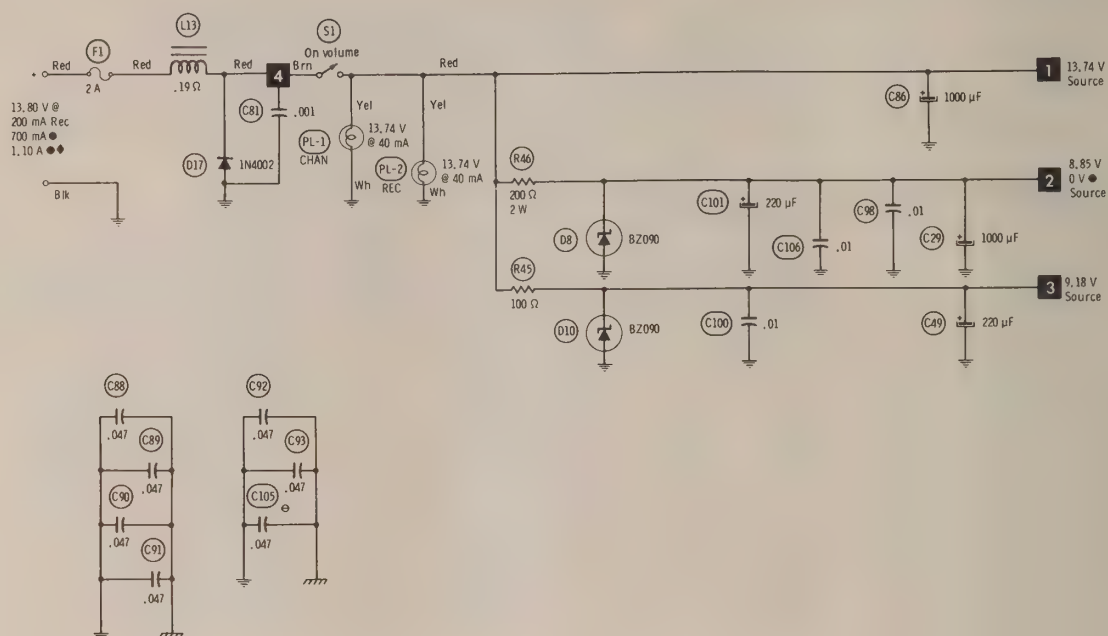
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
L13	1.1A	.19	1.93mH	5007-044 K-10 (1)	TR554		(1) Number on Unit.

TRANSFORMER (Driver)

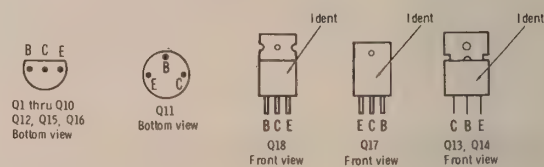
ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T6	3	1		5007-045 A-01A (1)	TR650		(1) Number on Unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE			REPLACEMENT DATA			NOTES
	PRI.	SEC.		MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T7	18	1 8	2 3.9	5007-046 E-52	TR809		



Terminal Guides



—X— Circuitry not used in some versions

--- Circuitry used in some versions

⊙ See parts list

✱ Nominal value

⊥ Ground

Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ◆ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

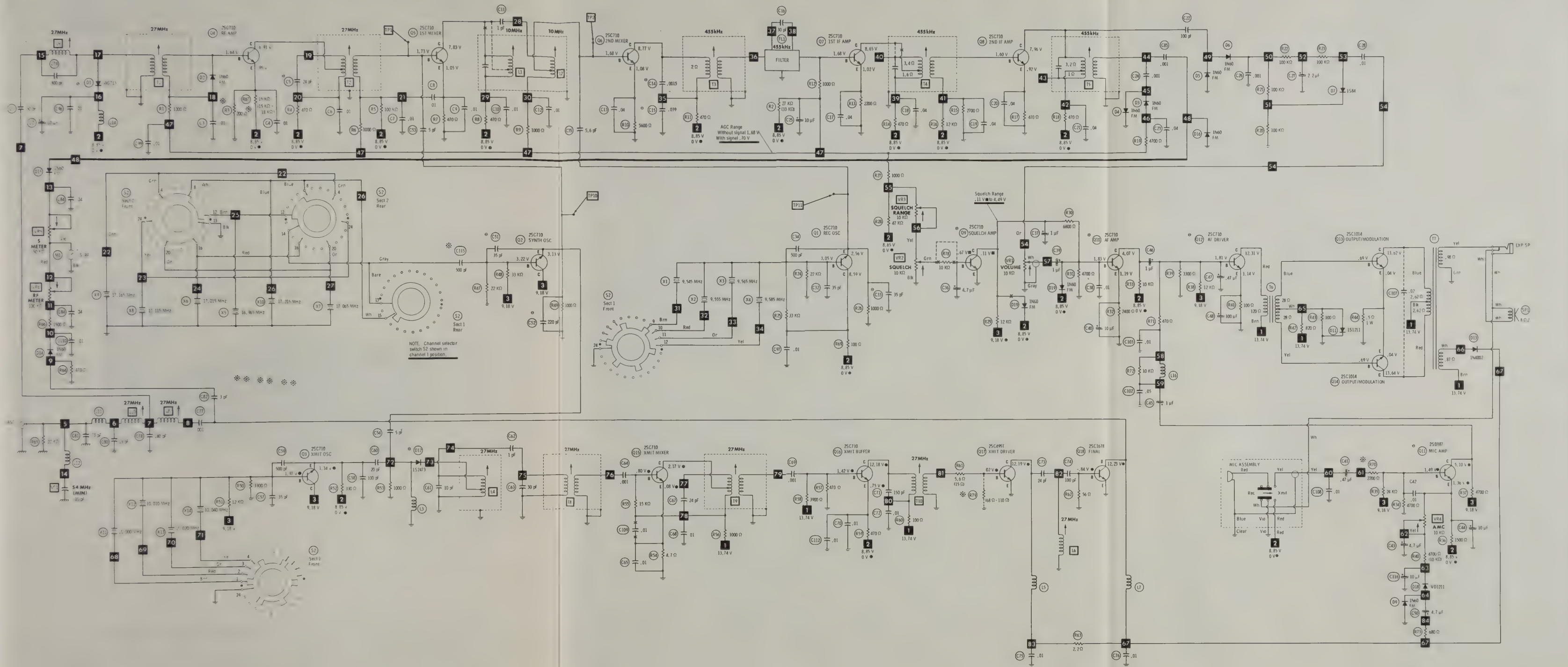
Value in () used in some versions.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

WITH **CIRCUITRACE**

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Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X5, X1, X11	7	X6, X3, X13	13	X8, X1, X11	19	X9, X3, X13
2	X5, X2, X12	8	X6, X4, X14	14	X8, X2, X12	20	X9, X4, X14
3	X5, X3, X13	9	X7, X1, X11	15	X8, X3, X13	21	X10, X1, X11
4	X5, X4, X14	10	X7, X2, X12	16	X8, X4, X14	22	X10, X2, X12
5	X6, X1, X11	11	X7, X3, X13	17	X9, X1, X11	23	
6	X6, X2, X12	12	X7, X4, X14	18	X9, X2, X12	23	X10, X4, X14



PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3" PM, 8 ohms	5012-018	30A05Z8R	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F	2A Quick-acting	5028-001		AGC2	ADJ	312002	150145	FG2-2

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC Lead Color →	Red	Shield	Yellow	Blue	White	Black
MIC	5004-018	18-032	18-034	18-010	Orig Color →	YEL	Shield	RED	White	NC	Shield

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	9.545	5003-130	SC35W9545	1,5,9,13,17,21	X8	17.115	5003-141	SA120W17115	13,14,15,16
X2	9.555	5003-131	SC35W9555	2,6,10,14,18,22	X9	17.165	5003-142	SA120W17165	17,18,19,20
X3	9.565	5003-132	SC35W9565	3,7,11,15,19	X10	17.215	5003-143	SA120W17215	21,22,23
X4	9.585	5003-133	SC35W9585	4,8,12,16,20,23	X11	10.000	5003-134	SA120W10000	1,5,9,13,17,21
X5	16.965	5003-138	SA120W16965	1,2,3,4	X12	10.010	5003-135	SA120W10010	2,6,10,14,18,22
X6	17.015	5003-139	SA120W17015	5,6,7,8	X13	10.020	5003-136	SB120W10020	3,7,11,15,19
X7	17.065	5003-140	SA120W17065	9,10,11,12	X14	10.040	5003-137	SB120W10040	4,8,12,16,20,23

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
FL1	Filter	5023-016	455kHz
M	Meter	5014-009	S/Rf
S2	Switch	5009-060	Channel Selector

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Cabinet, Top	5020-086	Knob, Channel Selector	5022-067
Cabinet, Bottom	5020-085	Knob, Control	5022-066
Front Panel	5020-084	Hanger, Mic	5005-001



PHOTOFACT[®] with

CIRCUITRACE[®]

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NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



SHAKESPEARE MODEL GBS2000

MODEL GBS2000 (MCB-22)

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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Printed in U. S. of America

7CY508

PARTS LIST AND DESCRIPTION (CONTINUED)
(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA					
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
						Q-LINE	GENERAL LINE	
C1	30	(1)	UK16-103	CD15ED300J03	SX430	QW1-14	MMA-300	
C3	.01				MAG1611		HY-420	
C4	.01				MAG1611		HY-420	
C5	24			CD15ED240J03	SX424	QW1-12	MMA-240	
	30			CD15ED300J03	SX430	QW1-14	MMA-300	
C6	.01		UK16-103		MAG1611		HY-420	
C7	.01				MAG1611		HY-420	
C8	.01				MAG1611		HY-420	
C9	.01				MAG1611		HY-420	
C10	.01				MAG1611		HY-420	
C11	1	(1)	UK16-103	CD15CD010003		QW1-1	MMA-010	
C12	.01				MAG1611		HY-420	
C13	.04				M192P3939R8		192P3939R8	
C14	.0015 10% 50V			CD19FD152J03	SX215		MWC-152	
	.001			CD19FD102J03	SX210		MWC-102	
C15	.039		DTZ-33		M192P3939R8		192P3939R8	
	.01			WMF1S1	ENF1A110	QF1-91	1PB-S10	
C16	30				CN0433		10TCC-Q33	
C17	.04				M192P3939R8		192P3939R8	
C18	.04				M192P3939R8		192P3939R8	
C19	.04	(1)	DD-102G		M192P3939R8		192P3939R8	
C20	.04				M192P3939R8		192P3939R8	
C21	.04				M192P3939R8		192P3939R8	
C22	100 10%			CD15FD101J03	SX310	QW1-27	192P3939R8	
C23	.04				M192P3939R8		MMA-101	
C24	.001		GP1000	GP210	QC2-81	192P3939R8		
C26	.001		GP1000	GP210	QC2-81	5GA-D10		
C28	.01 50V		GP1000	GP210	QC2-81	5GA-D10		
C32	35		(1)	UK16-103	CD15ED360J03	SX436		MMA-360
C33	35					CD15ED360J03	SX436	
	24				CD15ED240J03	SX424	QW1-12	MMA-240
C34	500 10%				CD15FD511J03	SX351	QW1-43	MMA-511
C35	5.6			CD15CD060D03		QW1-3	MMA-060	
C38	.01	UK16-103			MAG1611		HY-420	
C42	.01				MAG1611		HY-420	
C51	35			CD15ED360J03	SX436		MMA-360	
	220			CD15FD221J03	SX322	QW1-35	MMA-221	
C52	.001			CD15FD221J03	SX322	QW1-35	MMA-221	
	5		CD19FD102J03	SX210		MWC-102		
C53	5	(1)	DD-102G		CD15CD060D03	QW1-3	MMA-060	
C54	5				CD15CD060D03	QW1-3	MMA-060	
C57	35			CD15ED360J03	SX436		MMA-360	
C58	100 10%			CD15FD101J03	SX310	QW1-27	MMA-101	
C59	500			CD15FD511J03	SX351	QW1-43	MMA-511	
C60	20		UK16-103	CD15ED200J03	SX420	QW1-10	MMA-200	
C61	10			CD15CD100J03		QW1-6	MMA-100	
C62	1				CN0510		10TCC-V10	
C63	30			CD15ED300J03	SX430	QW1-14	MMA-300	
C64	.001		UK16-103		GP1000	QC2-81	5GA-D10	
C65	.01				MAG1611		HY-420	
C67	24			CD15ED240J03	SX424	QW1-12	MMA-240	
C68	.01				MAG1611		HY-420	
C69	.001	(1)	UK16-103	GP1000	GP210	QC2-81	5GA-D10	
C70	.01				MAG1611		HY-420	
C71	150 10%			CD15FD151J03	SX315	QW1-31	MMA-151	
C72	.01				MAG1611		HY-420	
C73	24			CD15ED240J03	SX424	QW1-12	MMA-240	
C74	100 10%		UK16-103	CD15FD101J03	SX310	QW1-27	MMA-101	
C75	.01				MAG1611		HY-420	
C76	.01				MAG1611		HY-420	
C77	.001			DD-102G	GP1000	QC2-81	5GA-D10	
C78	140 10%				CD15FD151J03	QW1-31	MMA-151	
C79	300 10%	(1)	UK16-103	CD15FD301J03	SX330	QW1-38	MMA-301	
C80	130 10%				CD15FD131J03	QW1-30	MMA-131	
C81	75 10%			CD15ED750J03	SX475	QW1-24	MMA-750	
C82	3			CD15CD050D03		QW1-2	MMA-050	
C83	.04				GP140		5GA-S40	
C84	.04		DD-102G		M192P3939R8		192P3939R8	
C85	.001			GP1000	GP210	QC2-81	5GA-D10	
C87	.001				GP1000	QC2-81	5GA-D10	
C88	.047			UK12-503	MAG1215		HY-350	
C89	.047			UK12-503	MAG1215		HY-350	
C90	.047	(1)		UK12-503	MAG1215		HY-350	
C91	.047			UK12-503	MAG1215		HY-350	
C92	.047			UK12-503	MAG1215		HY-350	
C93	.047			UK12-503	MAG1215		HY-350	
C96	.01	UK16-103		MAG1611		HY-420		
C97	.01			MAG1611		HY-420		
C98	.01			MAG1611		HY-420		
C99	.01			MAG1611		HY-420		
C100	.01			MAG1611		HY-420		
C102	.05 10%	(1)	UK16-103	DPMS2S5	ENF1A150		2PS-S50	
C103	.1 10% 50V			WMF05P1	ENF05010		431P1049R5	
C105	.01				MAG1611		HY-420	
C106	.01				MAG1611		HY-420	
C107	.02 50V				PVC212		2PS-S20	
C108	.01		UK16-103	DPMS2S2	MAG1611		HY-420	
C110	.01				MAG1611		HY-420	
C112	.01				MAG1611		HY-420	
C115	500 10%			CD15FD511J03	SX351	QW1-43	MMA-511	

(1) Used in some versions.

PARTS LIST AND DESCRIPTION (CONTINUED)
(When ordering parts, state Model, Part Number, and Description.)

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	Volume/Switch	10K	5008-089				
VR2	Squelch	10K	5008-088				
VR3	Squelch Range	10K	5008-007	T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
VR4	AMC	10K	5008-007	T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
VR5	S Meter	50K	5008-032	T-50K (2)	C-503 (2)	MTC54L1 (2)	X201R503B (2)
VR6	RF Meter	100K	5008-031	T-100K (2)	C-104 (2)	MTC15L1 (2)	X201R104B (2)

(2) Cut off one of the end terminals and bend to fit PC board.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Rec. Mixer (10MHz)	5006-291	42K-10		
L2	Rec. Mixer (10MHz)	5006-291	42K-10		
L3	RF Choke (22uH)	5006-288			
L4	Harmonic Suppressor (27MHz)	5006-297	507Y1		
L5	RF Choke	5006-287			
L6	Xmit Driver (27MHz)	5006-296	S-18		
L7	RF Choke (.65uH)	5006-285			
L8	Final Amp	5070-295	S-18		
L9	Rec. Antenna	5006-302	Z34300		
L10	Antenna Match(27MHz)	5070-295	S-18		
L11	RF Choke (.22uH)	5006-284			
L12	RF Choke (.85uH)	5006-286			
		5007-044	K-10		
L14	RF Choke (22uH)	5006-288			
L16	RF Choke	5006-289	K-58		
T1	Rec Antenna (27MHz)	5006-301	C29400		
T2	Rec RF (27MHz)	5006-300	C37780		
T3	IF (455kHz)	5006-294	A086A0		
T4	IF (455kHz)	5006-293	E1A227B		
T5	IF (455kHz)	5006-292	E1A146D		
T8	Xmit Osc (27MHz)	5006-298	507S311		
T9	Xmit Mixer (27MHz)	5006-299	C30580		
T10	Xmit Buffer(27MHz)	5006-303	C04200		

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (O CURRENT 1000—)	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
L13	1.1A	.19	1.93mH	5007-044 K-10 (1)	TR554		(1) Number on Unit.

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T6	3	1		5007-045 A-01A (1)	TR650		(1) Number on Unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T7	18	1 2 8 3.9	5007-046 E-52	TR809		

PARTS LIST AND DESCRIPTION (CONTINUED)
(When ordering parts, state Model, Part Number, and Description.)

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFR. PART No.	QUAM PART No.	
SP1	3" PM, 8 ohms	5012-018	30A0528R	

FUSE DEVICES

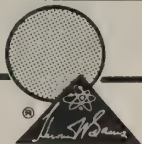
ITEM No.	DESCRIPTION	REPLACEMENT DATA					
		PART No.		BUSS PART No.		LITTELFUSE PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	WORKMAN PART No.
F	2A Quick-acting	5028-001		AGC2	ADJ	312002	F62-2

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA					
	MFR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC Lead Color →	Red	Shield	Yellow	Blue	White
MIC	5004-018	18-032	18-034	18-010	Orig Color →	YEL	Shield	RED	White	NC

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	9.545	5003-130	SC35W9545	1,5,9,13,17,21	X8	17.115	5003-141	SA120W17115	13,14,15,16
X2	9.555	5003-131	SC35W9555	2,6,10,14,18,22	X9	17.165	5003-142	SA120W17165	17,18,19,20
X3	9.565	5003-132	SC35W9565	3,7,11,15,19	X10	17.215	5003-143	SA120W17215	21,22,23
X4	9.585	5003-133	SC35W9585	4,8,12,16,20,23	X11	10.000	5003-134	SA120W10000	1,5,9,13,17,21
X5	16.965	5003-138	SA120W16965	1,2,3,4	X12	10.010	5003-135	SA120W10010	2,6,10,14,16,22
X6	17.015	5003-139	SA120W17015	5,6,7,8	X13	10.020	5003-136	SB120W10020	3,7,11,15,19
X7	17.065	5003-140	SA120W17065	9,10,11,12	X14	10.040	5003-137	SB120W10040	4,8,12,16,20,23



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

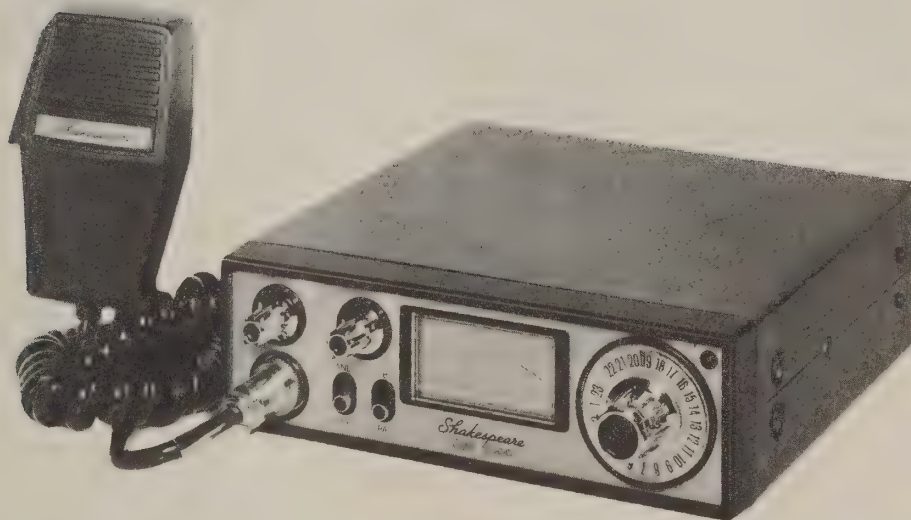
Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



SHAKESPEARE MODEL GBS2000

MODEL GBS2000(MCB-22)

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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Printed in U. S. of America

7CY508

ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period.
Adjustments made with 13.8-volt DC input.
Connect low sides of test equipment to ground unless specified otherwise.
Connect 50-ohm dummy load or antenna before keying transmitter.
Suggested Alignment Tools: GC ELECTRONICS
L3, L4, L5, L6, L7, L16, L18, L19.....5009
L1, L2, L8, L9, L10, L11, L12, L13.....9440

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Inputs of frequency counter and RF VTVM to TP1.	Ch. 13	L8	Adjust for maximum at 37.750MHz.
Input of frequency counter to TP1.	Ch. 17 Ch. 21 Ch. 1 Ch. 5 Ch. 9		Check for 37.800MHz. Check for 37.850MHz. Check for 37.600MHz. Check for 37.650MHz. Check for 37.700MHz.
Input of frequency counter to TP2.	Ch. 13 Ch. 14 Ch. 15 Ch. 16		Check for 10.180MHz. Check for 10.170MHz. Check for 10.160MHz. Check for 10.140MHz.
Input of frequency counter to TP3.	Ch. 13, Xmit Ch. 14, Xmit Ch. 15, Xmit Ch. 16, Xmit		Check for 10.635MHz. Check for 10.625MHz. Check for 10.615MHz. Check for 10.595MHz.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.
Set generator output low enough to prevent AGC limiting.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP4. 455kHz, 1000Hz @ 30% modulation.	Ch. 13	L7,L6,L5	Adjust for maximum output.
Output of signal generator thru .01uF to TP5. 10.635MHz, 1000Hz @ 30% modulation.	Ch. 13	L4,L3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation.	Ch. 13	L2,L1	Adjust for maximum output. Repeat above steps, if necessary.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil.
Adjust volume control to obtain a suitable indication.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 1000uV.	Ch. 13	VR3	SQUELCH RANGE Set squelch control VR2 fully clockwise. Adjust VR3 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.115MHz, 1000Hz @ 30% modulation. Output 100uV.	Ch. 13	VR6	S METER Adjust VR6 for 9 on S scale of meter.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.

See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Input of spectrum analyzer to antenna jack.	Ch. 13	L9,L10,L11, L12,L13, L16,L18	Adjust for maximum.
	Ch. 13	L18	Adjust for 4 watts maximum.
	Ch. 13	L19	Adjust for MINIMUM at 54MHz.

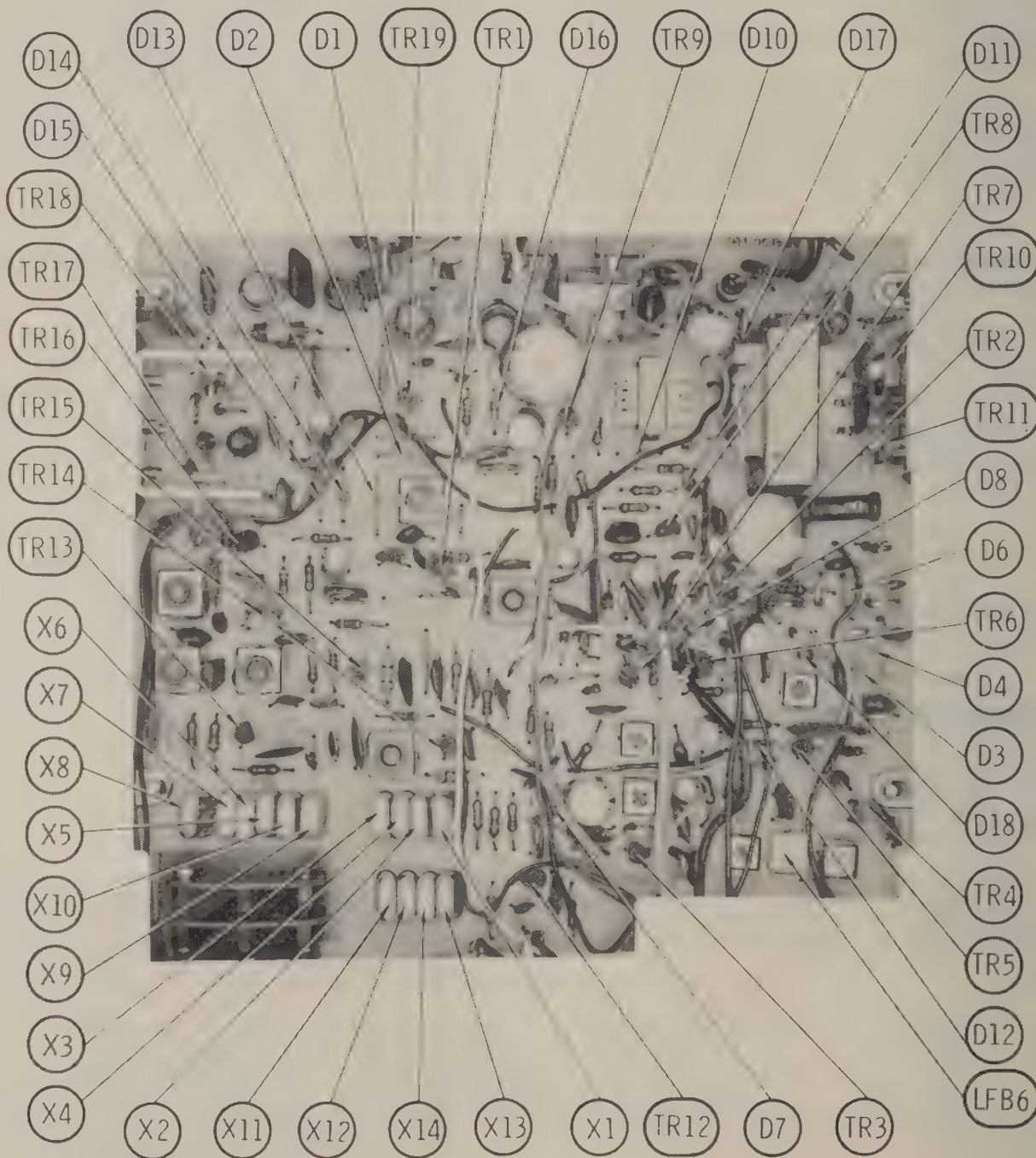
TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

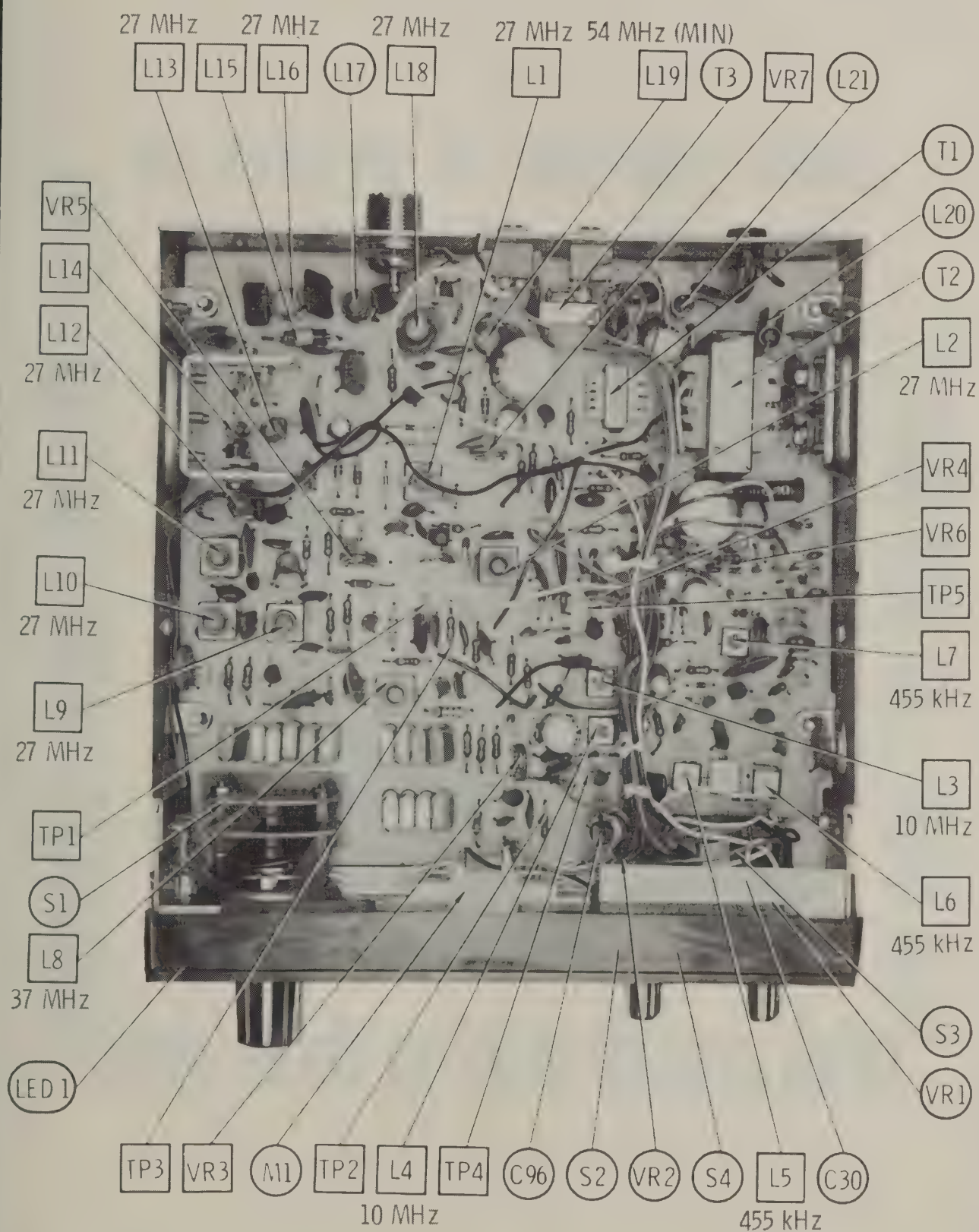
NOTE: Be sure to check transmit frequency and power on all active channels after adjustments of transmitter.

See page 4 for channel frequencies.

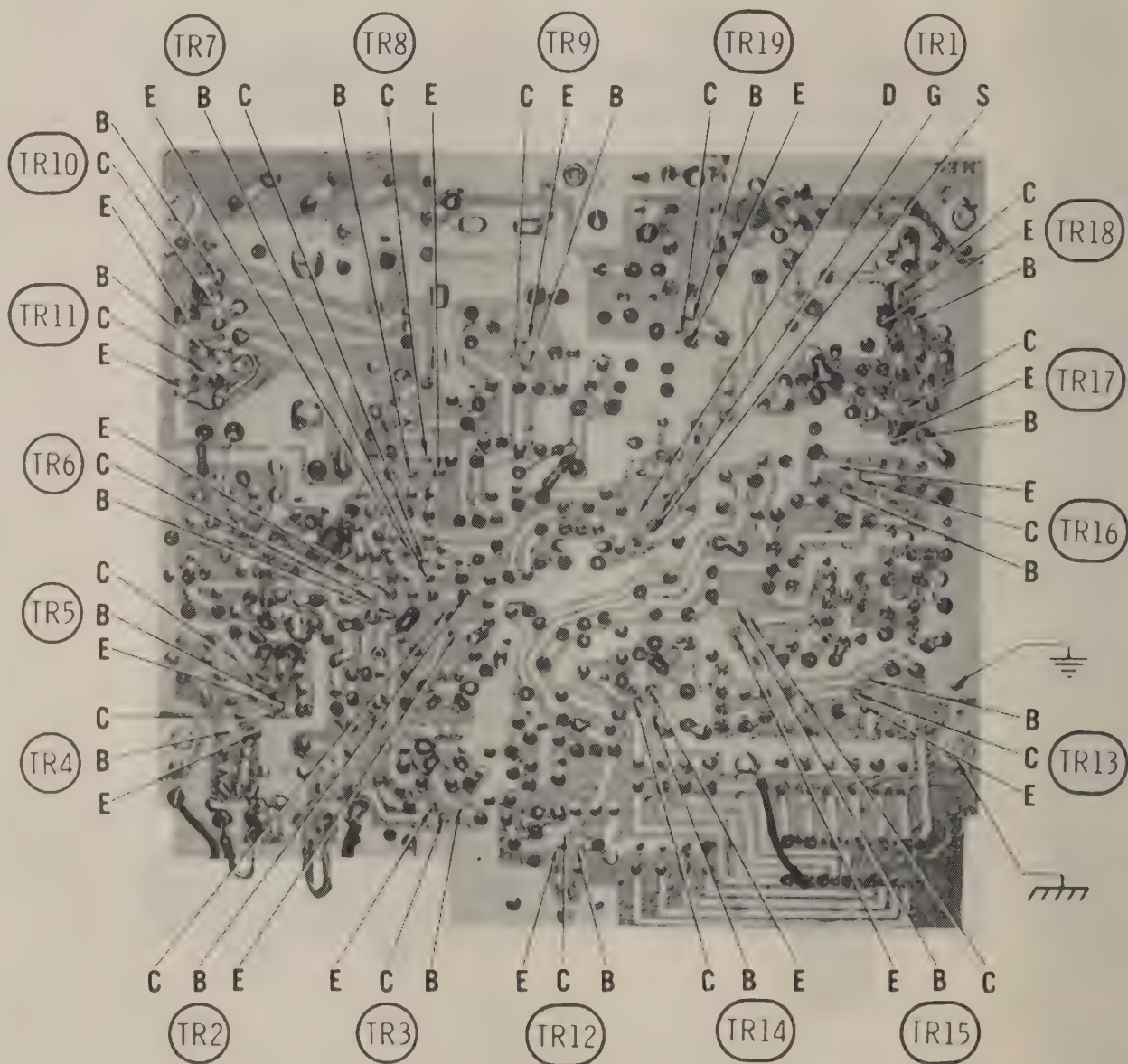
TEST EQUIPMENT	TRANSCEIVER	ADJUST	REMARKS
Modulation meter to antenna jack. Inject a 1000Hz signal at mic input.	Ch. 13	VR5	AMC Disconnect C53 to disable AMC. Adjust signal for over-modulation. Restore AMC operation. Adjust VR5 for 100% modulation maximum.
Modulation meter to antenna jack. Inject a 1000Hz, 1mV signal at mic input.	Ch. 13	VR4	MIC GAIN Disconnect C53. Adjust VR4 for 100% modulation. Reconnect C53.
	Ch. 13	VR7	RF PANEL METER Adjust VR7 so that RF panel meter agrees with RF wattmeter.



MAIN BOARD



CHASSIS-BOTTOM



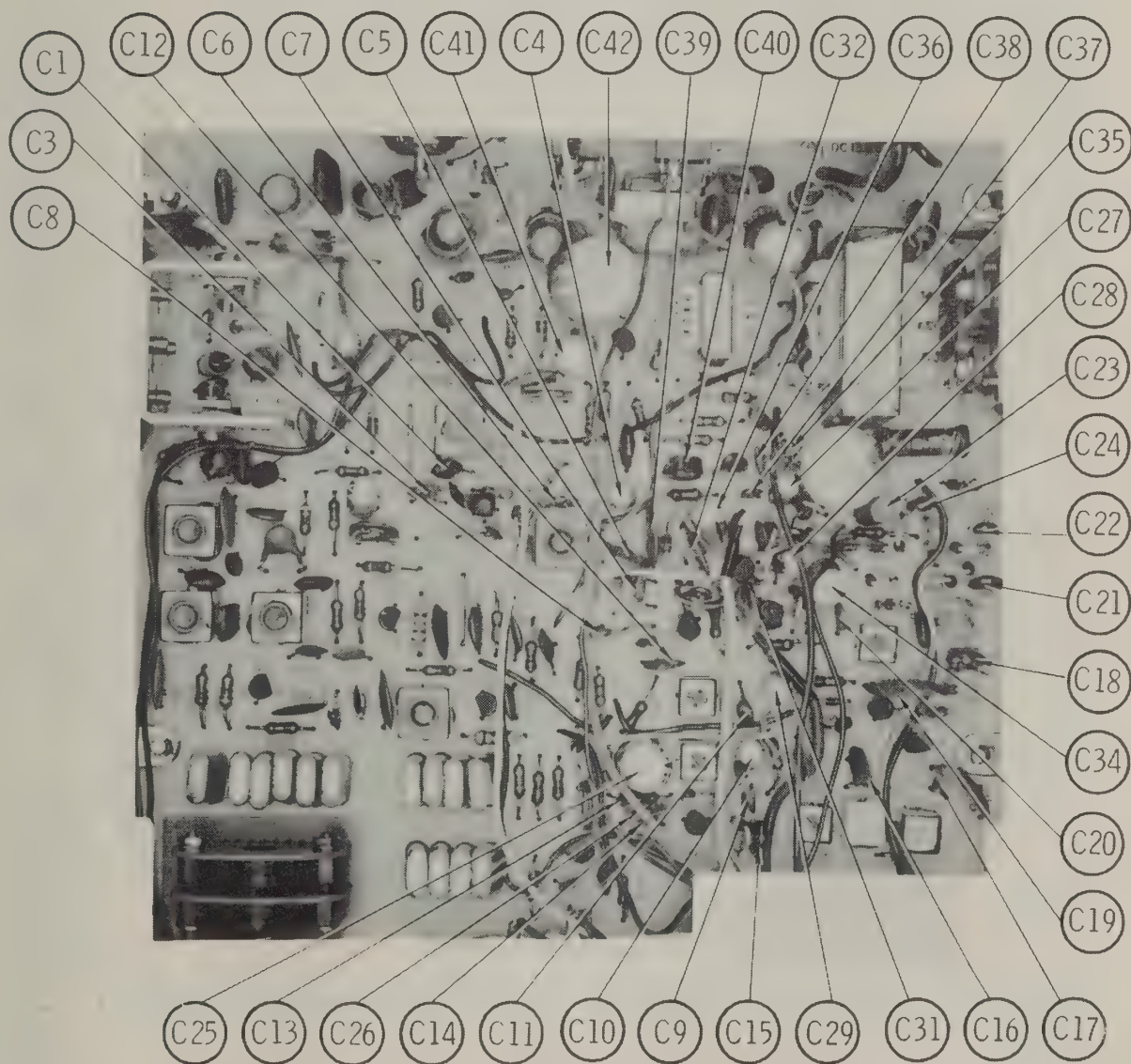
MAIN BOARD



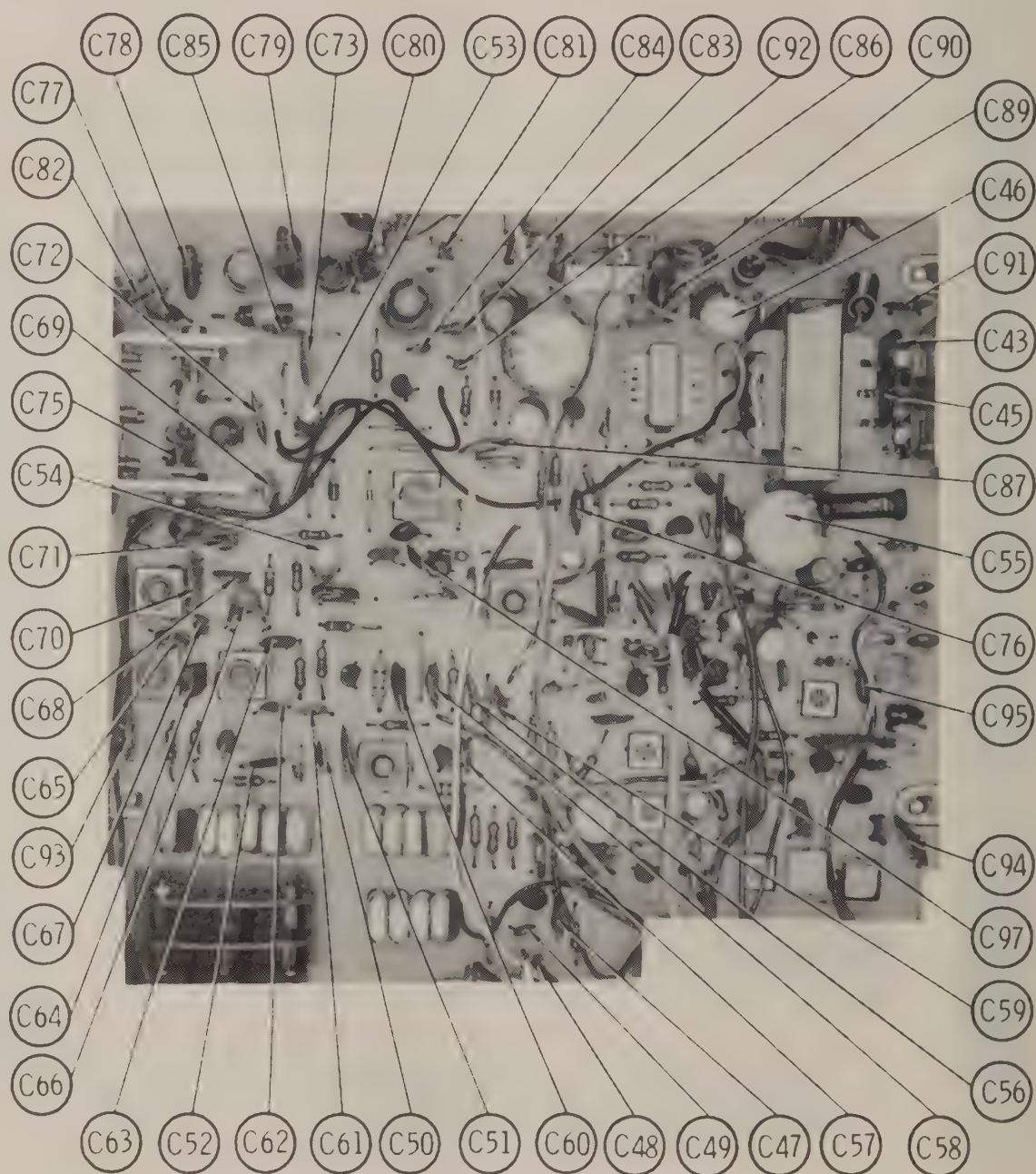
MAIN BOARD



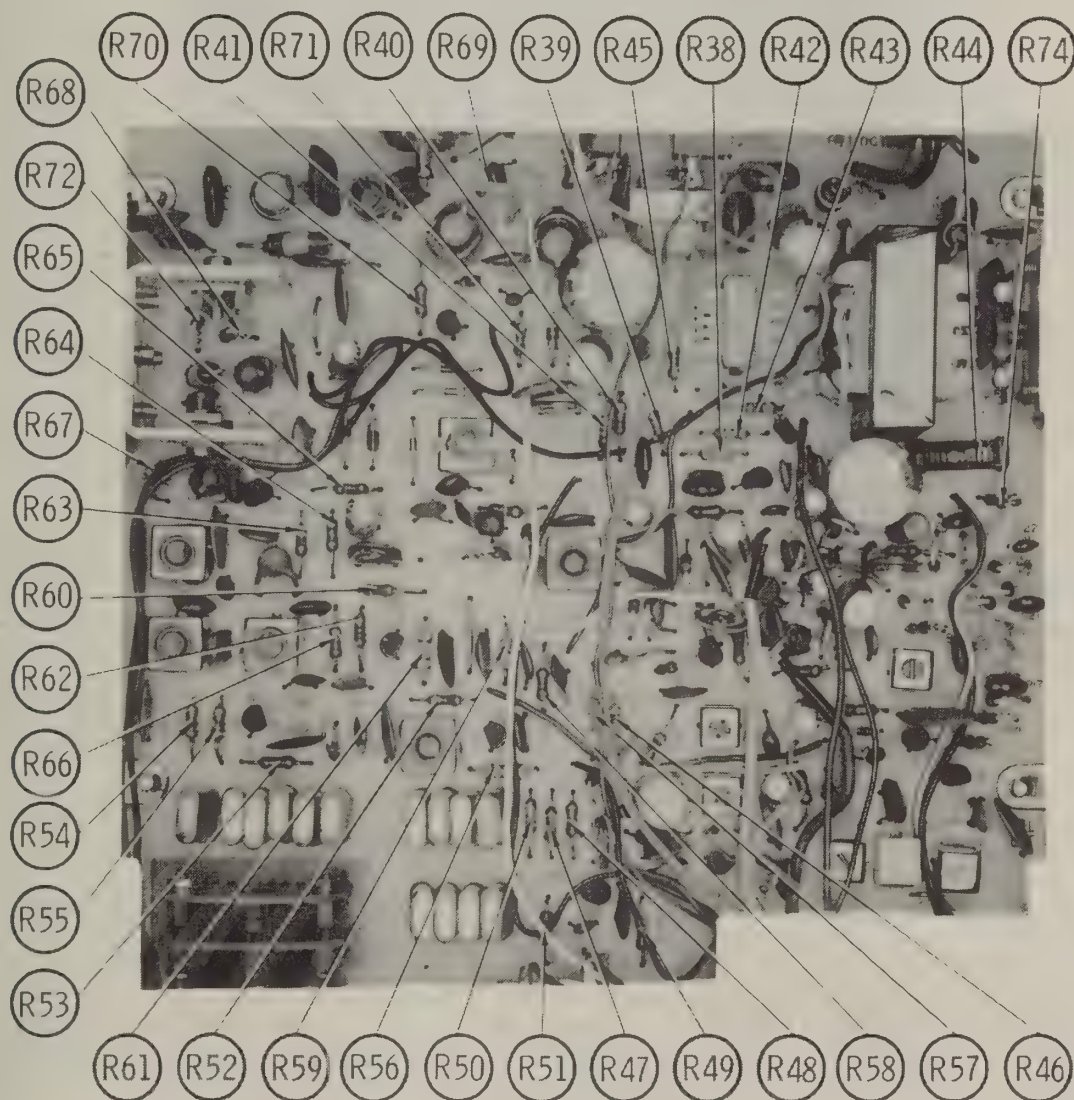
MAIN BOARD



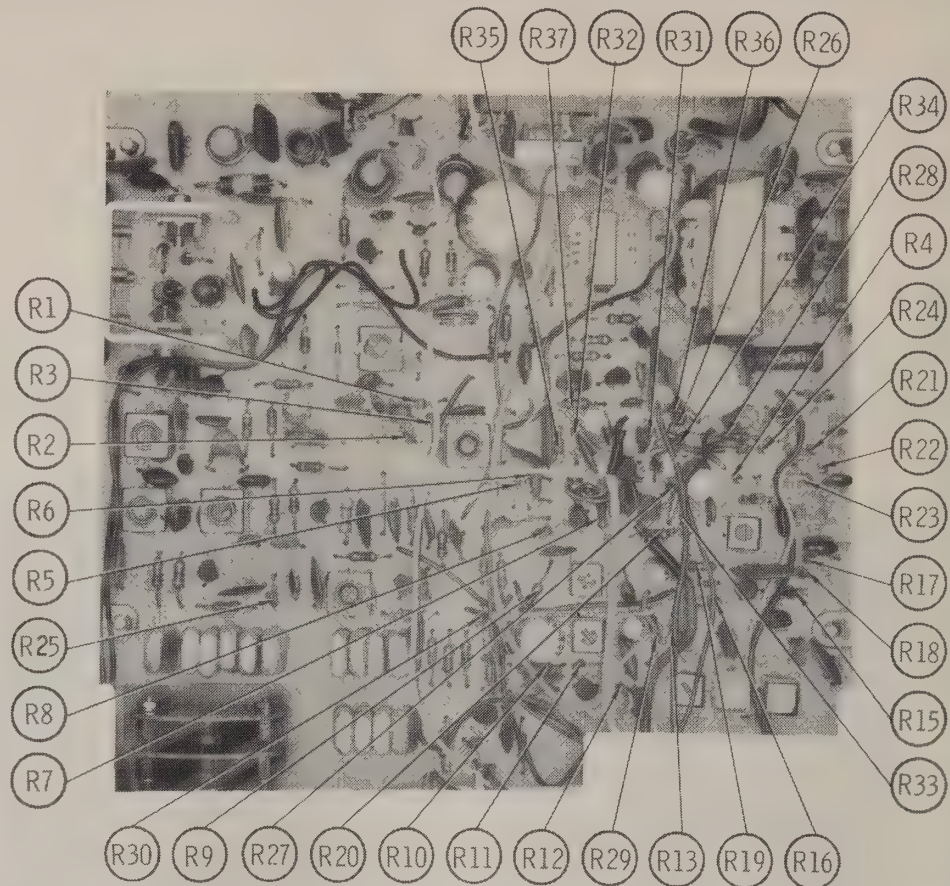
MAIN BOARD



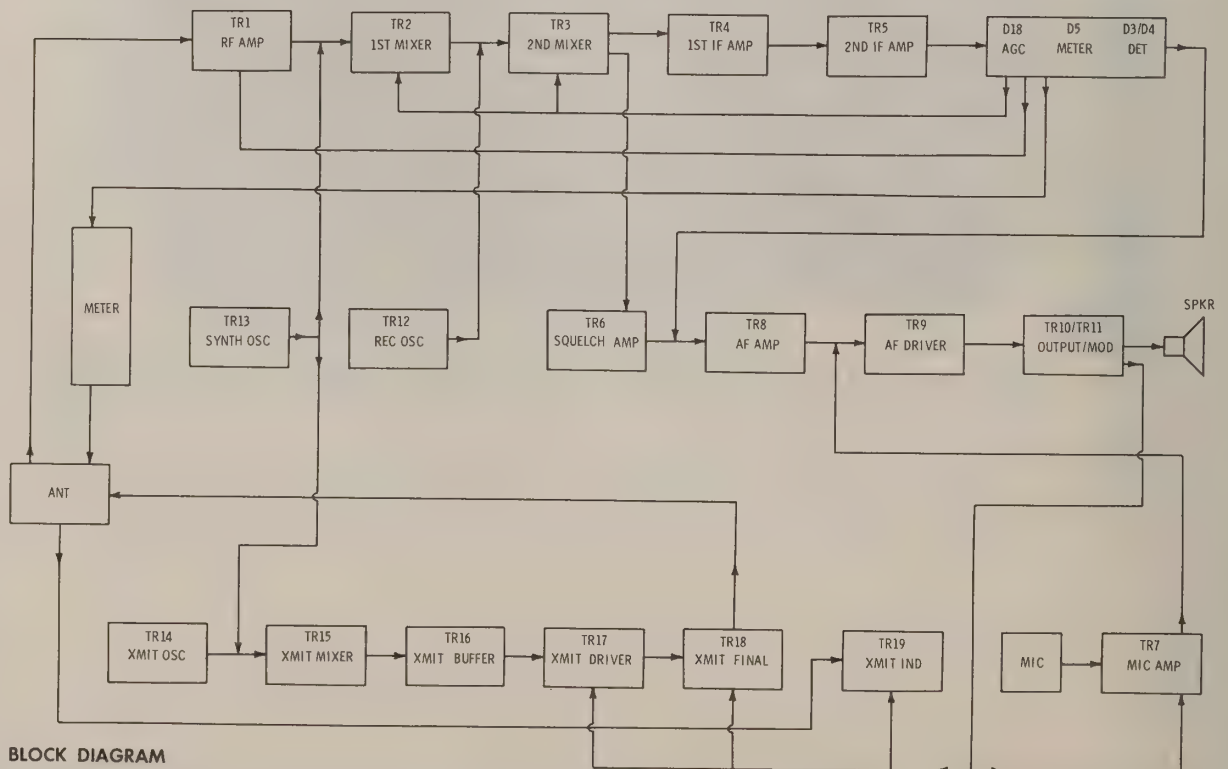
MAIN BOARD



MAIN BOARD



MAIN BOARD

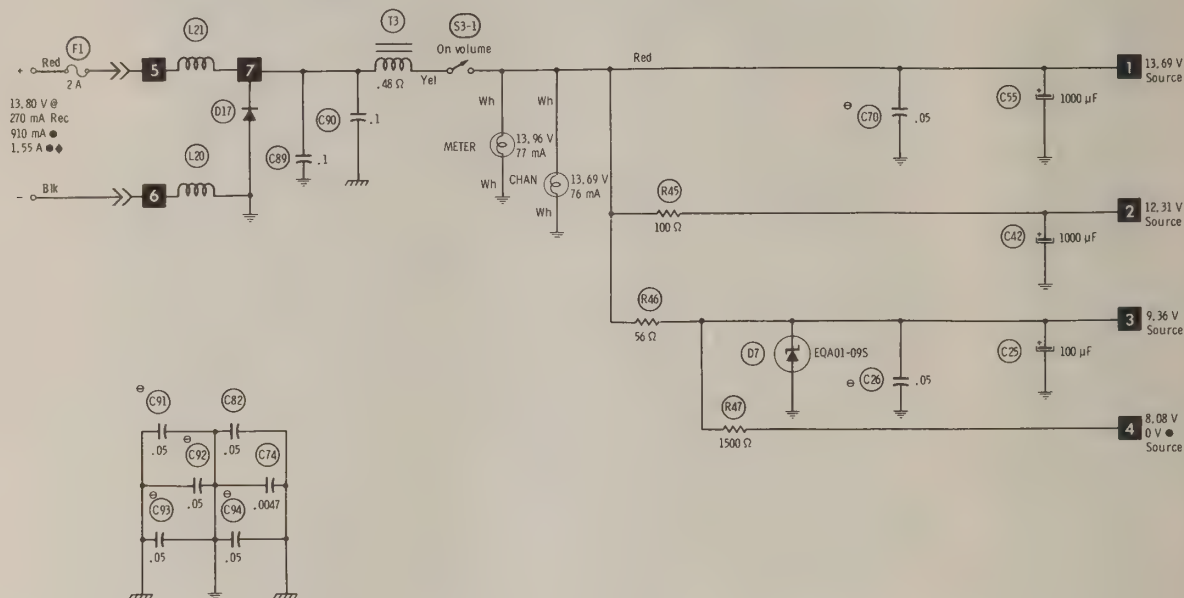


PARTS LIST AND DESCRIPTION
(When ordering parts, state Model, Part Number, and Description.)

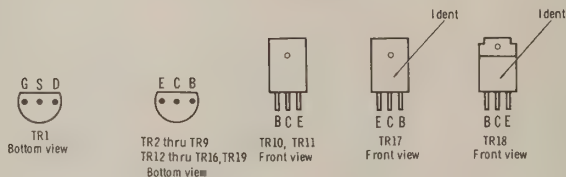
SHAKESPEARE MODEL GBS2000C

(15) T:EW @ T:SA:

85



Terminal Guides



Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X5, X1, X11	7	X6, X3, X13	13	X8, X1, X11	19	X9, X3, X13
2	X5, X2, X12	8	X6, X4, X14	14	X8, X2, X12	20	X9, X4, X14
3	X5, X3, X13	9	X7, X1, X11	15	X8, X3, X13	21	X10, X1, X11
4	X5, X4, X14	10	X7, X2, X12	16	X8, X4, X14	22	X10, X2, X12
5	X6, X1, X11	11	X7, X3, X13	17	X9, X1, X11	23	X10, X4, X14
6	X6, X2, X12	12	X7, X4, X14	18	X9, X2, X12		

—*— Circuitry not used in some versions

--- Circuitry used in some versions

⊖ See parts list

⊛ Nominal value

⊕ Ground

⏏ Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ♦ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

Value in () used in some versions.

A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE

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PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C95	56 5%	(1)	DTZ-100 DD-201	CD15ED56QJ03 CD15ED51QJ03 NP0100 GP200	SX456 CN0310 GP320	QW1-21 QW1-20	MWA-560 MWA-510 10TCC-T10 10TS-T20
C97	22 NP0						
C98	200						
C99	330						

*Not normally in distributor's stock. Available thru distributor on order to manufacturer.

(1) Used in some versions.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	Volume/Switch	10K		T-50K (2) T-50K (2) T-20K (2) T-20K (2) T-20K (2) T-50K (2)	C-503 (2) C-503 (2) C-253 (2) C-253 (2) C-503 (2)	MTC54L1 (2) MTC54L1 (2) MTC24L1 (2) MTC24L1 (2) MTC54L1 (2)	X201R503B (2) X201R503B (2) X201R253B (2) X201R253B (2) X201R503B (2)
VR2	Squelch	50K					
VR3	Squelch Range	50K					
VR4	Afc Gain	50K					
VR5	AMC	20K					
VR6	S Meter	20K					
VR7	RF Meter	50K					

(2) Cut off one of the end terminals and bend to fit PC board.

COILS (RF-IF)

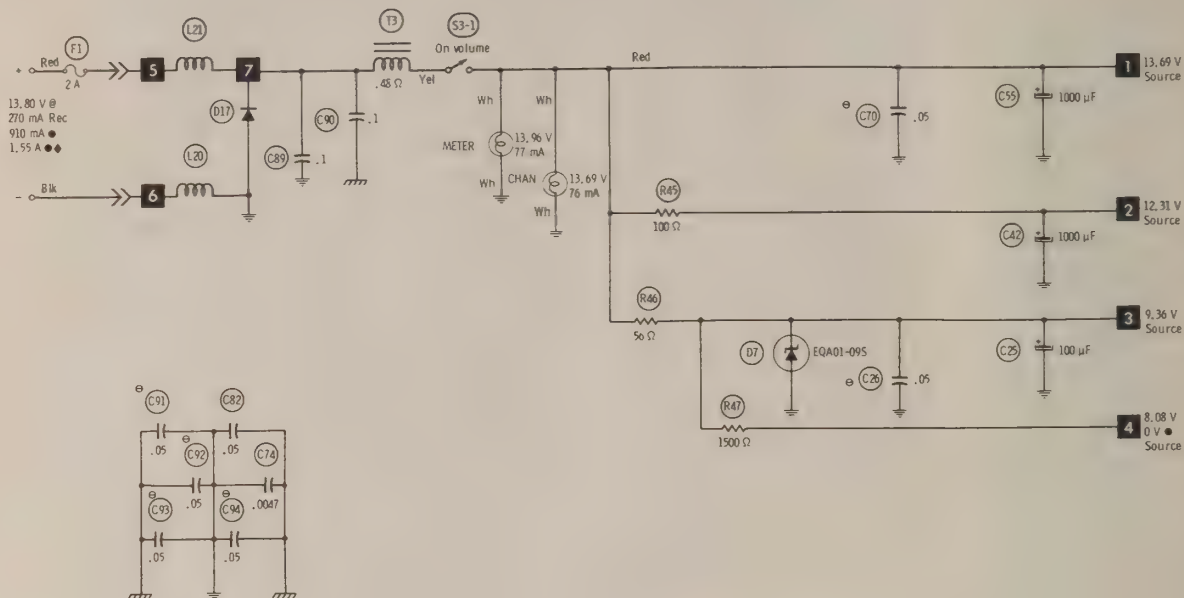
ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Rec Ant (27MHz)		AT21		
L2	Rec RF (27MHz)		MT22		
L3	Rec Mixer (10MHz)		83X		
L4	Rec Mixer (10MHz)		83X		
L5	IF (455kHz)		MT24		
L6	IF (455kHz)		MT25		
L7	IF (455kHz)		MT26		
L8	Synth Osc (37MHz)		MT27		
L9	Harmonic Suppressor (27MHz)		T52		
L10	Harmonic Suppressor (27MHz)		T52		
L11	Xmit Mixer (27MHz)		T58		
L12	Xmit Buffer (27MHz)				
L13	Xmit Driver (27MHz)				
L14	RF Choke				
L15	RF Choke				
L16	Final Amp (27MHz)				
L17	RF Choke				
L18	Antenna Match (27MHz)				
L19	TVI Trap (54MHz)				
L20	RF Choke				
L21	RF Choke				

FILTER CHOKE

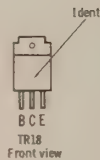
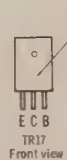
ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T3	1.55A	.48	3.66mH				

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T1	.8	1					



Terminal Guides



—*— Circuitry not used in some versions

--- Circuitry used in some versions

⊖ See parts list

⊗ Nominal value

⊕ Ground

Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ◆ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

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Resistors are 1/2W or less, 5% unless noted.

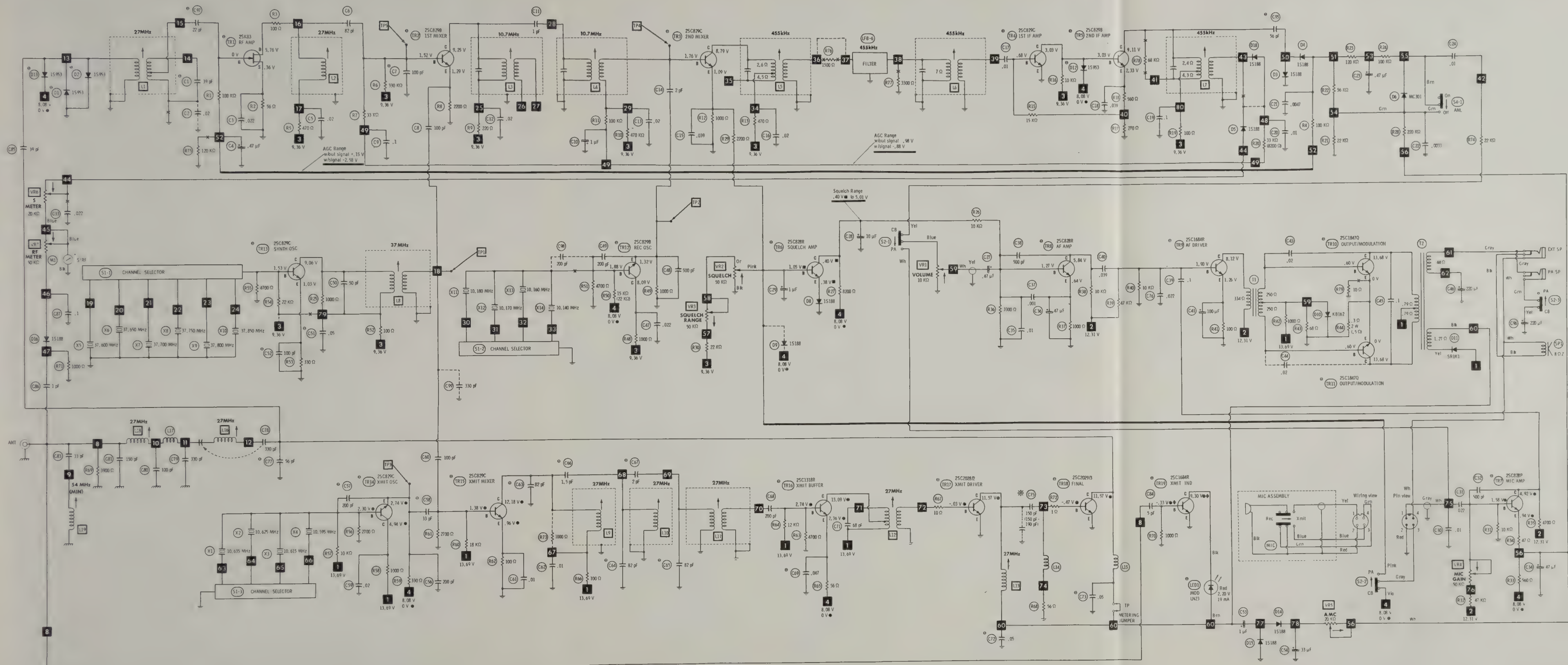
Value in () used in some versions.

A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH **CIRCUITRACE**

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3	X5, X3, X13	9	X7, X1, X11	15	X8, X3, X13	21	X10, X1, X11
4	X5, X4, X14	10	X7, X2, X12	16	X8, X4, X14	22	X10, X2, X12
5	X6, X1, X11	11	X7, X3, X13	17	X9, X1, X11		
6	X6, X2, X12	12	X7, X4, X14	18	X9, X2, X12	23	X10, X4, X14



PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE			REPLACEMENT DATA			NOTES
	PRI.	SEC.		MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T2	54	1 8	2 26				

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3 5/8" PM, 8 Ohms		3A05Z8	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2A			AGC2	HDJ	312002	150145	FG2-2

MICROPHONE

ITEM No.	MFGR. PART No.	REPLACEMENT DATA			CONNECTION DATA						
		GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIC		18-032	18-034	18-010	18-092	1	2	3	4	NC	2

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	10.635		DB100W10.635	1,5,9,13,17,21	X8	37.750		DA20W37.750	13,14,15,16
X2	10.625		DB100W10.625	2,6,10,14,18,22	X9	37.800		DA20W37.800	17,18,19,20
X3	10.615		DB100W10.615	3,7,11,15,19	X10	37.850		DA20W37.850	21,22,23
X4	10.595		DB100W10.595	4,8,12,16,20,23	X11	10.180		DC134W10.180	1,5,9,13,17,21
X5	37.600		DA20W37.600	1,2,3,4	X12	10.170		DC134W10.170	2,6,10,14,18,22
X6	37.650		DA20W37.650	5,6,7,8	X13	10.160		DC134W10.170	3,7,11,15,19
X7	37.700		DA20W37.700	9,10,11,12	X14	10.140		DC134W10.140	4,8,12,16,20,23

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
LED1	LED		Modulation Indicator
LFB6	Filter		455kHz
M1	Meter		S/R
S1	Switch		Channel Selector
S2	Switch		CB/PA

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors
Shielded Antenna Lead	8524 (Stranded) Available in 13 Colors
	8214 Lowest-loss (RG-8/U Type)
	8237 Low-loss (RG-8/U)
	8240 (Solid) Miniature (RG-58/U)
	8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

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(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

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Connect either 50-ohm dummy load or the normally used antenna system.



SHARP MODEL CB-700

MODEL CB-700

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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7CY492

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	39	(1)		CD15ED39QJ03	SX439	QW1-17	MMA-390
C2	47			CD15ED47QJ03	SX447	QW1-19	MMA-470
C3	.02		UK50-223		MAG5012		HY-725
C4	.022		UK25-223				
C5	.02		UK50-223				
C6	82 5%		DTZ-82	NP082	CN0482	10TCC-Q82	
C7	100 10%	(1)	DTZ-100	GP100	GP310	10TS-T10	
C8	150		DTZ-150		CN0315	10TCC-T15	
C9	100 10%		DD-101	GP100	GP310	10TS-T10	
C10	.1		UK12-104		MAG1201	HY-360	
C11	1 NPO				CN0510	10TCC-V10	
C12	.02		UK50-223		MAG5012		
C13	.02		UK50-223		MAG5012		
C14	2 NPO		DTZ-2R2	NP02P2	CN0522	10TCC-V22	
C15	.039 10%				M192P3939R8	192P3939R8	
C16	.02		UK50-223		MAG5012		
C17	.01		UK25-103		MAG2511	HY-520	
C18	.039 10%				M192P3939R8	192P3939R8	
C19	.1		UK12-104		MAG1201	HY-360	
C20	.01		UK25-103		MAG2511	HY-520	
C21	.0047		DD-472	GP4700	GP247	5GA-047	
C22	.0033 50V				M192P3329R8	192P3329R8	
C23	.01 10%			WMF1S1	EMF1A110	1PB-S10	
C24	.05		UK50-503		MAG5015		
C25	.04				M192P3939R8	192P3939R8	
C26	.01	(1)	UK25-103		MAG2511	HY-520	
C27	.022 50V				M192P2239R8	192P2239R8	
C28	500		DD-501	GP500	GP350	10TS-T50	
C29	.022				M192P2239R8	192P2239R8	
C30	.01			WMF1S1	EMF1A110	1PB-S10	
C31	.001		DD-102G	GP1000	GP210	10TS-T50	
C32	500		DD-501	GP500	GP350	5GA-D10	
C33	.1		UK12-104		MAG1201	HY-360	
C34	.039				M192P3939R8	192P3939R8	
C35	.02 50V	(1)		DPMS2S2	PVC212	2PS-S20	
C36	.1			DPMS2S2	PVC212	1PB-P10	
C37	.022		UK25-223		EMF1A010	HY-725	
C38	500		DD-501	GP500	GP350	10TS-T50	
C39	200		DD-201	GP200	GP320	10TS-T20	
C40	50 NPO		DTZ-47	NP047	CN0447	10TCC-Q47	
C41	.05		UK50-503		MAG5015		
C42	100	(1)			M192P3939R8	192P3939R8	
C43	30		DD-101	GP100	GP310	10TS-T10	
C44	200	(1)	DTZ-33	NP033	CN0433	10TCC-Q33	
C45	200		DD-201	GP200	GP320	10TS-T20	
C46	100	(1)	DD-101	GP100	GP310	10TS-T10	
C47	33 N150					10TCP-Q33	
C48	.02		UK50-223		MAG5012		
C49	.02		DD-101	GP100	GP310	10TS-T10	
C50	.01		UK16-103		MAG1611	HY-420	
C51	.01		UK16-103		MAG1611	HY-420	
C52	82 10%	(1)		CD15ED82QJ03	SX482	QW1-25	MMA-820
C53	100			CD15FD101J03	SX310	QW1-27	MMA-101
C54	82 10%	(1)		CD15ED82QJ03	SX482	QW1-25	MMA-820
C55	100			CD15FD101J03	SX310	QW1-27	MMA-101
C56	82 10%	(1)		CD15ED82QJ03	SX482	QW1-25	MMA-820
C57	100			CD15FD101J03	SX310	QW1-27	MMA-101
C58	1.5 NPO ±.25	(1)	DTZ-1R5	NP01P5	CN0515	10TCC-V15	
C59	2		DTZ-2R2	NP02P2	CN0522	10TCC-V22	
C60	2 NPO	(1)	DTZ-2R2	NP02P2	CN0522	10TCC-V22	
C61	3		DTZ-3R3	NP03P3	CN0533	10TCC-V33	
C62	200	(1)	DD-201	GP200	GP320	10TS-T20	
C63	.047		UK16-503		MAG1615	HY-635	
C64	.04	(1)			M192P3939R8	192P3939R8	
C65	.05		UK50-503		MAG5015		
C66	.04	(1)			M192P3939R8	192P3939R8	
C67	68 10%		UK50-503		MAG5015		
C68	.05	(1)			M192P3939R8	192P3939R8	
C69	.04		UK50-503		MAG5015		
C70	.04	(1)			M192P3939R8	192P3939R8	
C71	.04		UK50-503		MAG5015		
C72	.05	(1)			M192P3939R8	192P3939R8	
C73	.04		UK50-503		MAG5015		
C74	.04	(1)			M192P3939R8	192P3939R8	
C75	.0047		DD-472	GP4700	GP247	5GA-047	
C76	150	(1)	DTZ-150		CN0315	10TCC-T15	
C77	150-190						
C78	.022				M192P2239R8	192P2239R8	
C79	56 5%	(1)			CD15ED56QJ03	SX456	QW1-21
C80	50				CD15ED51QJ03	SX456	QW1-20
C81	330 5%				CD15FD331J03	SX333	QW1-39
C82	330 5%				CD15FD331J03	SX333	QW1-39
C83	100 10%		DTZ-150		SX310	10TCC-T15	
C84	150 10%				CN0315	5GA-S40	
C85	.04					10TCP-Q33	
C86	33 N150 ±10%					10TCC-V47	
C87	5 NPO		DTZ-4R7	NP04P7	CN0547	10TCC-Q39	
C88	.1				CN0439	10TCC-V10	
C89	.1 10% 100V		UK16-104		MAG1601	HY-650	
C90	.1 10% 100V			DPMS2P1	EMF1A010	1PB-P10	
C91	.05	(1)	UK50-503		EMF1A010		
C92	.04				MAG5015		
C93	.05	(1)	UK50-503		M192P3939R8	192P3939R8	
C94	.04				MAG5015		
C95	.05	(1)	UK50-503		M192P3939R8	192P3939R8	
C96	.04				MAG5015		

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS (cont)

ITEM No.	RATING	MFG. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C95	56 5%	(1)			CD15ED56QJ03	SX456	QW1-21
C97	22 NPO		DTZ-100		CD15ED51QJ03	SX456	QW1-20
C98	200		DD-201		NP0100	CN0310	MMA-560
C99	330	(1)			GP200	GP320	MMA-510

*Not normally in distributor's stock. Available thru distributor on order to manufacturer.
(1) Used in some versions.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFG. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	Volume/Switch	10K					
VR2	Squelch	50K					
VR3	Squelch Range	50K		T-50K (2)	C-503 (2)	MTC54L1 (2)	X201R503B (2)
VR4	IFc Gain	50K		T-50K (2)	C-503 (2)	MTC54L1 (2)	X201R503B (2)
VR5	AFC	20K		T-20K (2)	C-253 (2)	MTC24L1 (2)	X201R253B (2)
VR6	S Meter	20K		T-20K (2)	C-253 (2)	MTC24L1 (2)	X201R253B (2)
VR7	RF Meter	50K		T-50K (2)	C-503 (2)	MTC54L1 (2)	X201R503B (2)

(2) Cut off one of the end terminals and bend to fit PC board.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	Rec Ant (27MHz)		AT21		
L2	Rec RF (27MHz)		MT22		
L3	Rec Mixer (10MHz)		83X		
L4	Rec Mixer (10MHz)		83X		
L5	IF (455kHz)		MT24		
L6	IF (455kHz)		MT25		
L7	IF (455kHz)		MT26		
L8	Synth Osc (37MHz)		MT27		
L9	Harmonic Suppressor (27MHz)		T52		
L10	Harmonic Suppressor (27MHz)		T52		
L11	Xmit Mixer (27MHz)		T58		
L12	Xmit Buffer (27MHz)				
L13	Xmit Driver (27MHz)				
L14	RF Choke				
L15	RF Choke				
L16	Final Amp (27MHz)				
L17	RF Choke				
L18	Antenna Match (27MHz)				
L19	TVI Trap (54MHz)				
L20	RF Choke				
L21	RF Choke				

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000 ~)	MFG. PART No.	THORDARSON PART No.	TRIAD PART No.	
T3	1.55A	.48	3.66mH				

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
				MFG. PART No.	THORDARSON PART No.	TRIAD PART No.	
	PRI.	SEC. 1	SEC. 2				
T1	.8	1					

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

TRANSFORMER (Audio Output)

ITEM No	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFRG. PART No.	THORDARSON PART No	TRIAD PART No	
T2	54	1 2	2 0			

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	3 5/8" PH, 8 Ohms		3A05Z8	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA					
		PART No.		BUSS PART No.		LITTELFUSE PART No.	
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER
F1	2A			AGL	HUJ	3100	150145

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA							
	MFG. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black	GC
MIC		18-032	18-034	18-010	18-092	1	2	3	4	5	6	7

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFG. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFG. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	10.635		DB100W10.635	1,5,9,13,17,21	X8	17.750		DA20W37.750	13,14,15,16
X2	10.635		DB100W10.625	2,6,10,14,18,22	X9	17.800		DA20W37.800	17,18,19,20
X3	11.615		UB100W10.615	3,7,11,15,19		DA20W37.850		21,22,23	
X4	10.595		DB100W10.595	4,8,12,16,20,23	X11	10.180		DC134W10.180	1,2,3,4,13,17,21
X5	37.600		DA20W37.600	1,2,3,4	X12	10.170		DC134W10.170	2,6,10,14,18,22
X6	37.650		DA20W37.650	5,6,7,8	X13	10.160		DC134W10.170	3,7,11,15,19
X7	37.700		DA20W37.700	9,10,11,12	X14	10.140		DC134W10.140	4,8,12,16,20,23



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL CB-700

SHARP MODEL CB-700

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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Printed in U. S. of America

7CY492

ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period. Adjustments made with 13.8-volt DC input. Connect low sides of test equipment to ground unless specified otherwise. Connect 50-ohm dummy load or antenna before keying transmitter. Suggested Alignment Tools: GC Electronics:

L302,L303,T301,T303,T304,T3,T4,T5,T6.....5009
L201,L304,L305,T1,T2,T201,T202.....9440

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Inputs of frequency counter to TP1.	Ch. 13 Ch. 17 Ch. 21 Ch. 1 Ch. 5 Ch. 9	L201	Disconnect C208. Adjust L201 for 23.440MHz. Check for 23.490MHz. Check for 23.540MHz. Check for 23.290MHz. Check for 23.340MHz. Check for 23.390MHz. Reconnect C208.
Inputs of frequency counter to TP1.	Ch. 3 Ch. 4 Ch. 1 Ch. 2	T201	Disconnect C207. Adjust T201 for 14.970MHz. Check for 14.990MHz. Check for 14.950MHz. Check for 14.960MHz. Reconnect C207.
Input of RF VTVM to TP2.	Ch. 13	T202	Adjust for maximum.
Input of frequency counter to TP10.	Ch. 13, Delta Tune - Center	T6	Adjust for 11.730MHz.
Input of frequency counter to TP12.	To space between Ch. 1 and Ch. 23, Xmit	T301	Adjust for 11.275MHz.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication. Set generator output low enough to prevent AGC limiting.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Output of signal generator thru .01uF to TP11. 455kHz,1000Hz @ 30% modulation.	Ch. 13, Delta Tune - Center	T5	Adjust for maximum output.
Output of signal generator thru .01uF to TP12. 11.275MHz,1000Hz @ 30% modulation.	Ch. 13	T4,T3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.115MHz,1000Hz @ 30% modulation.	Ch. 13	T2,T1	Adjust for maximum output. Repeat above steps, if necessary.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter.

See page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
	Ch. 13	T302,T303, T304,L302, L303	Adjust for maximum.
	Ch. 13	L303	Adjust for 4 watts maximum.
Input of Spectrum analyzer to antenna jack.	Ch. 13	L305	Adjust for MINIMUM at 54MHz.
Input of Spectrum analyzer to antenna jack.	Ch. 13	L304	Adjust for MINIMUM at 81MHz.

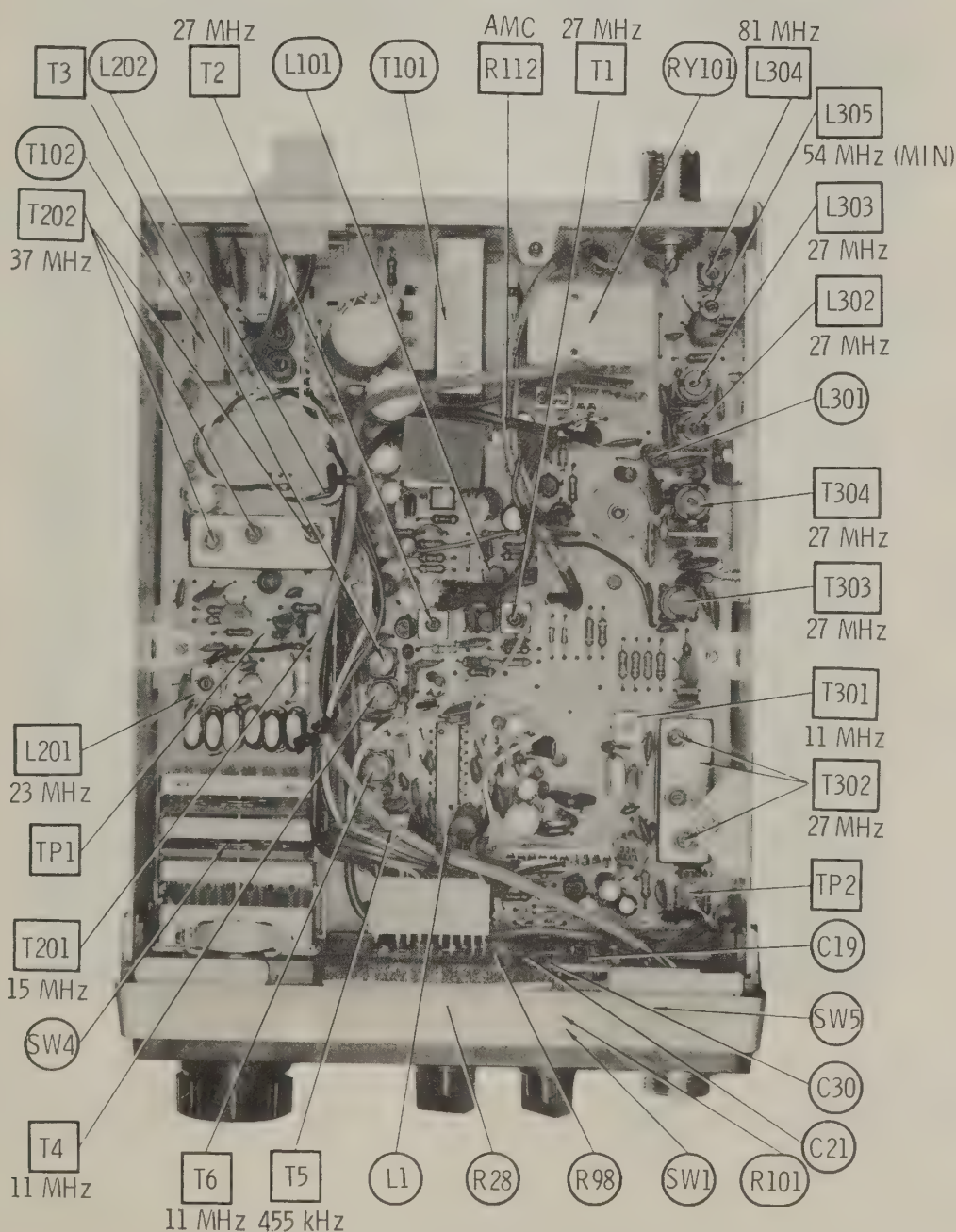
TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after adjustments of transmitter.

See page 4 for channel frequencies.

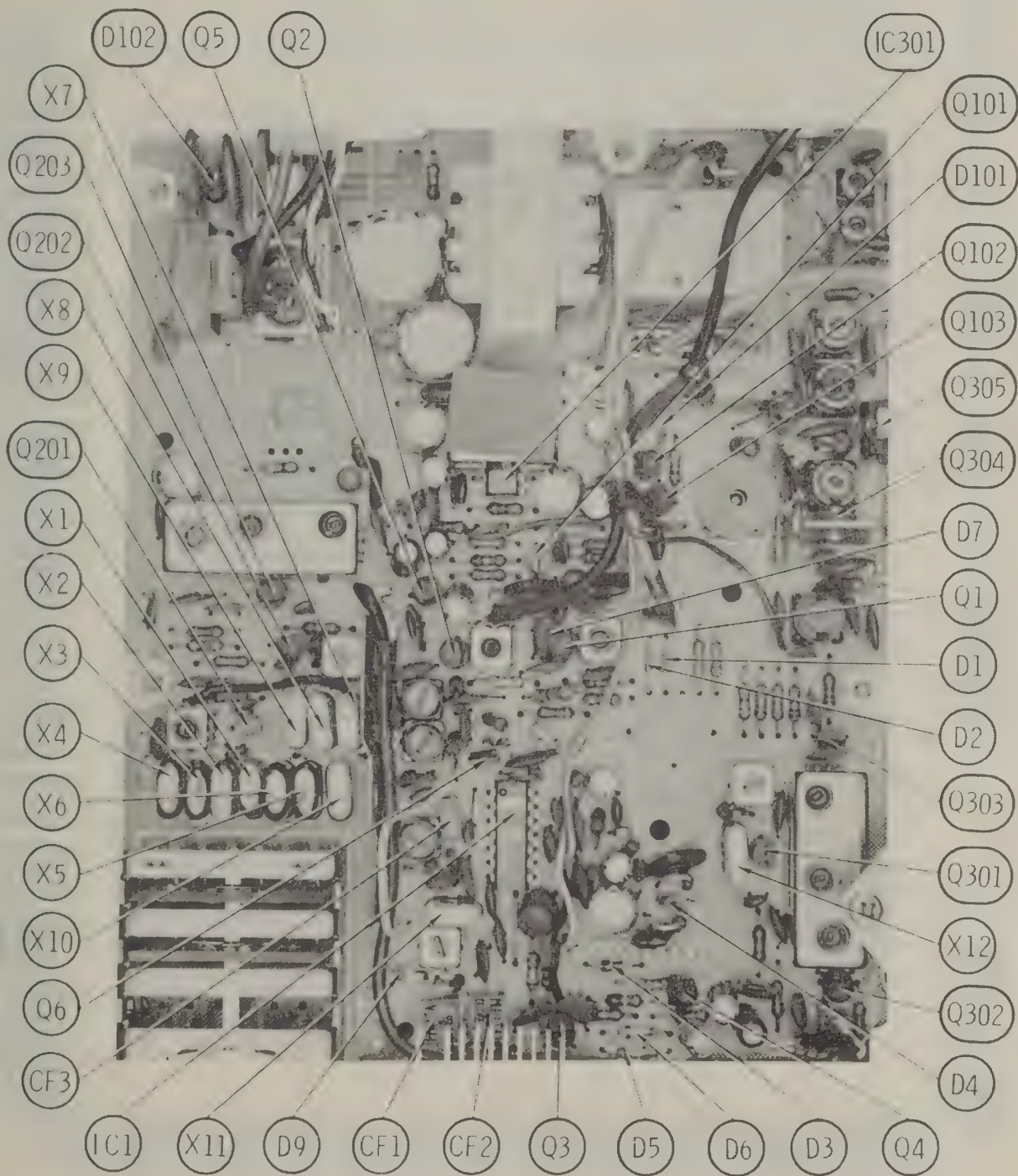
TEST EQUIPMENT	TRANSCIVER	ADJUST	REMARKS
Modulation meter to antenna jack. Inject a 1000Hz signal at MIC input.	Ch. 13	R112	AMC Disconnect D101 to disable AMC. Adjust signal for overmodulation. Restore AMC operation. Adjust R112 for 100% modulation maximum.



CHASSIS-BOTTOM



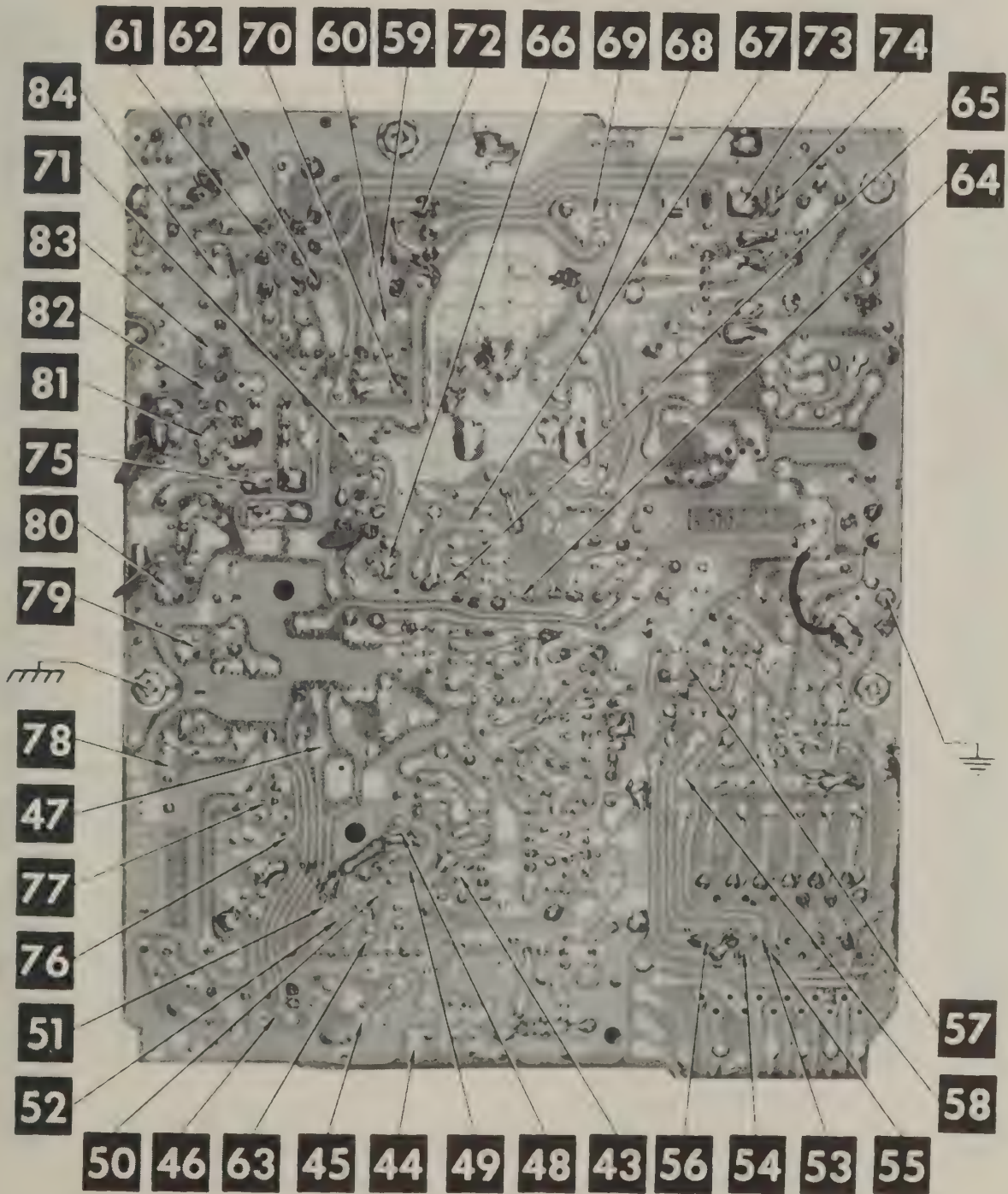
MAIN BOARD



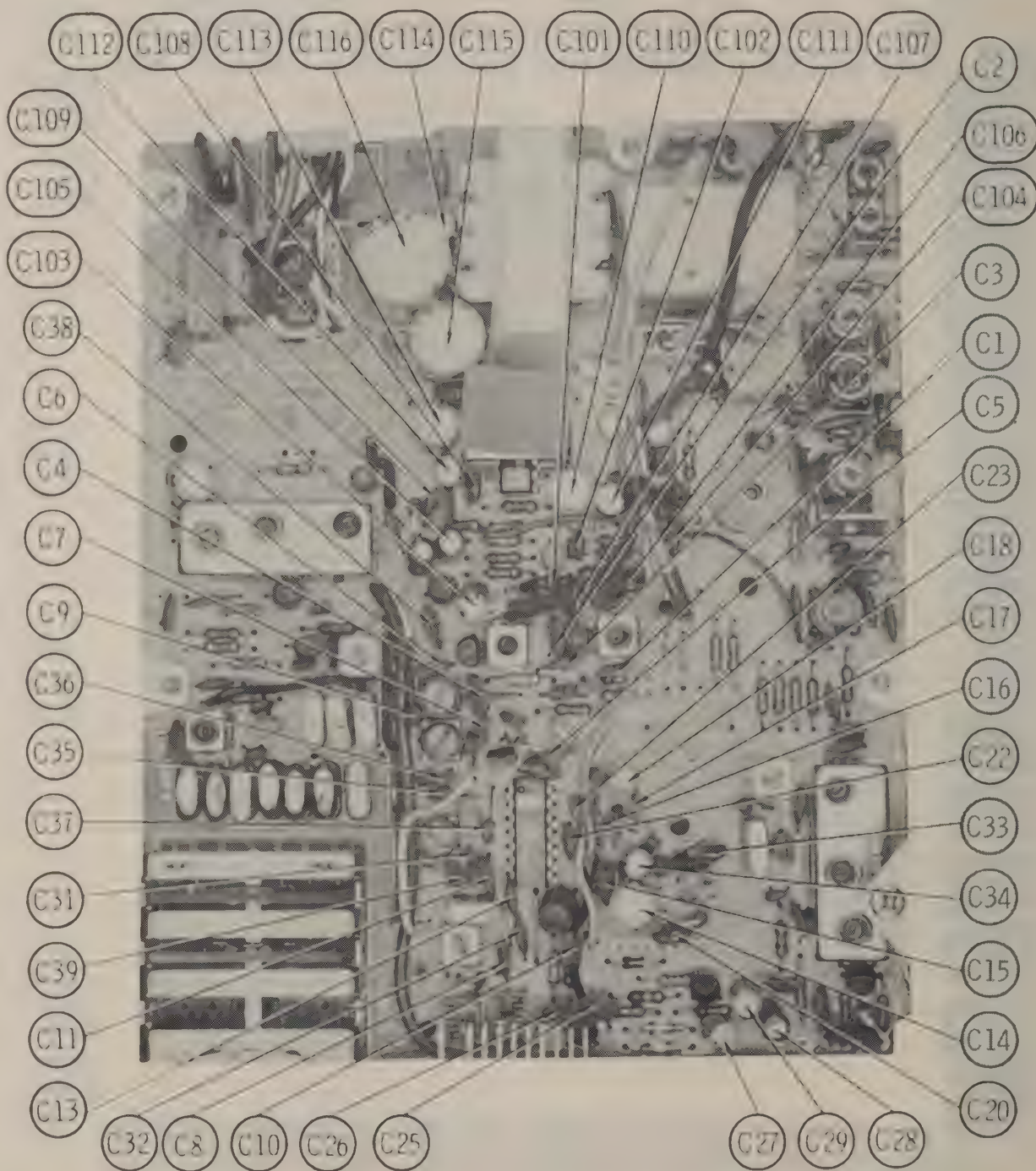
MAIN BOARD



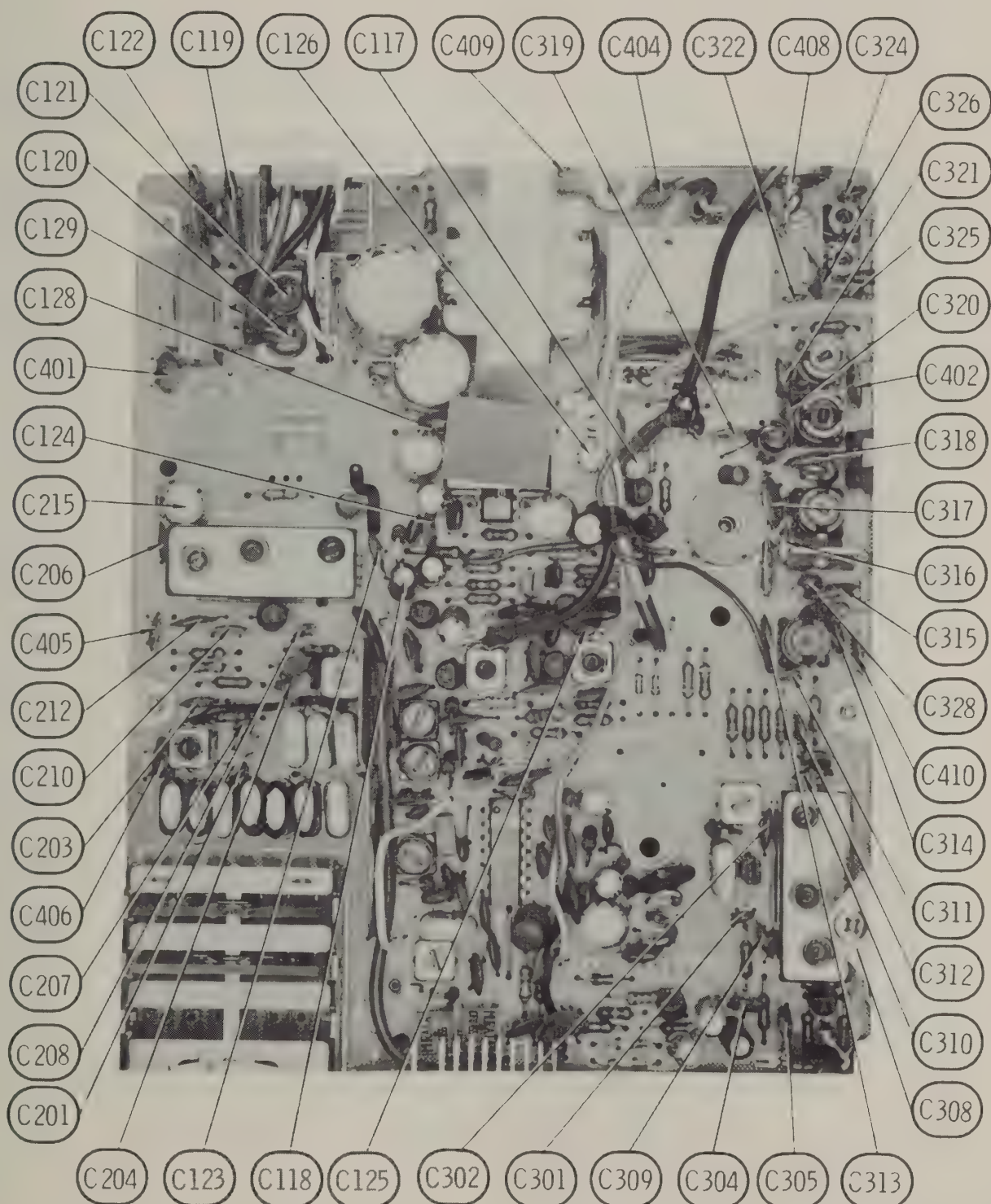
MAIN BOARD



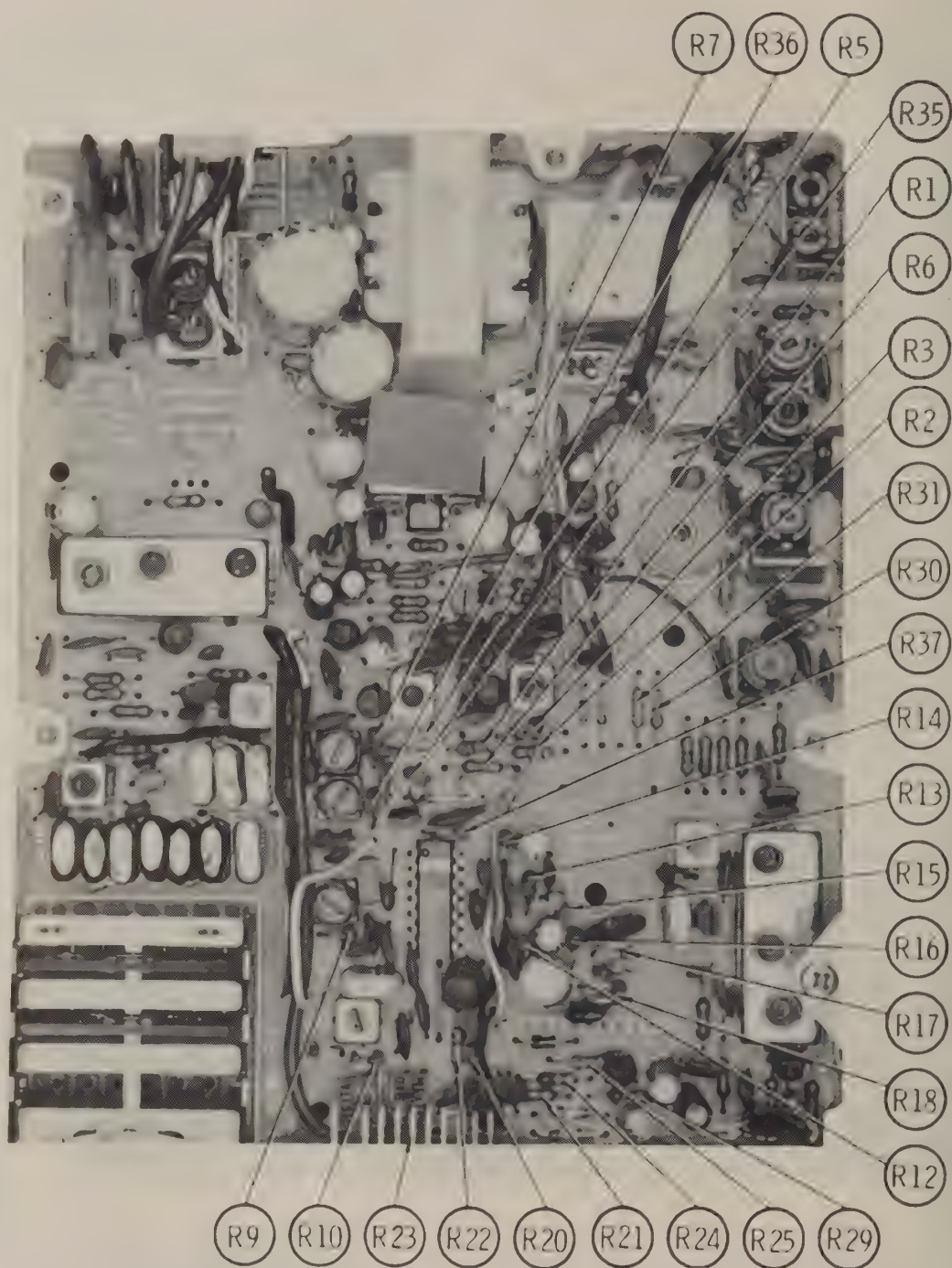
MAIN BOARD



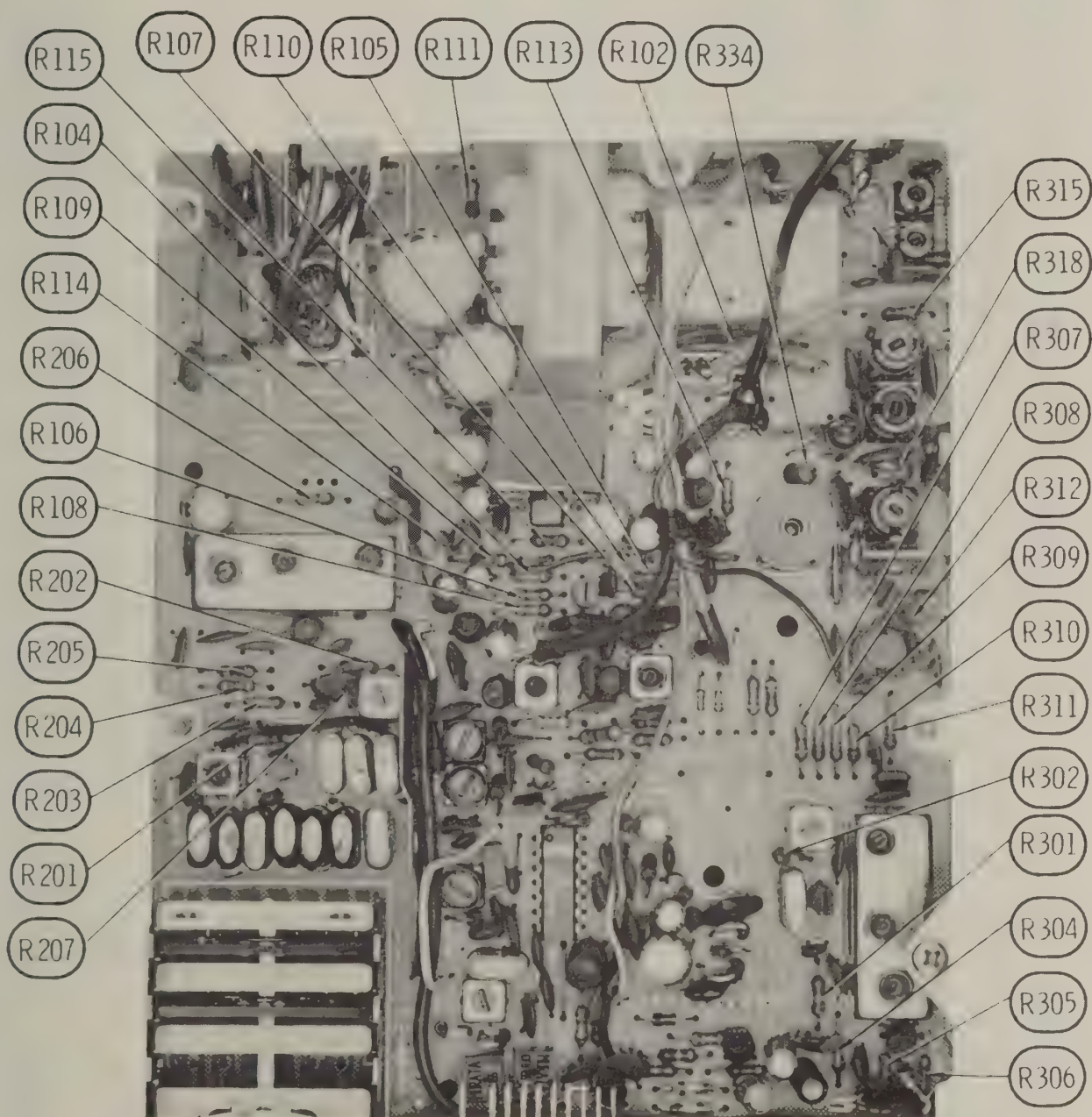
MAIN BOARD



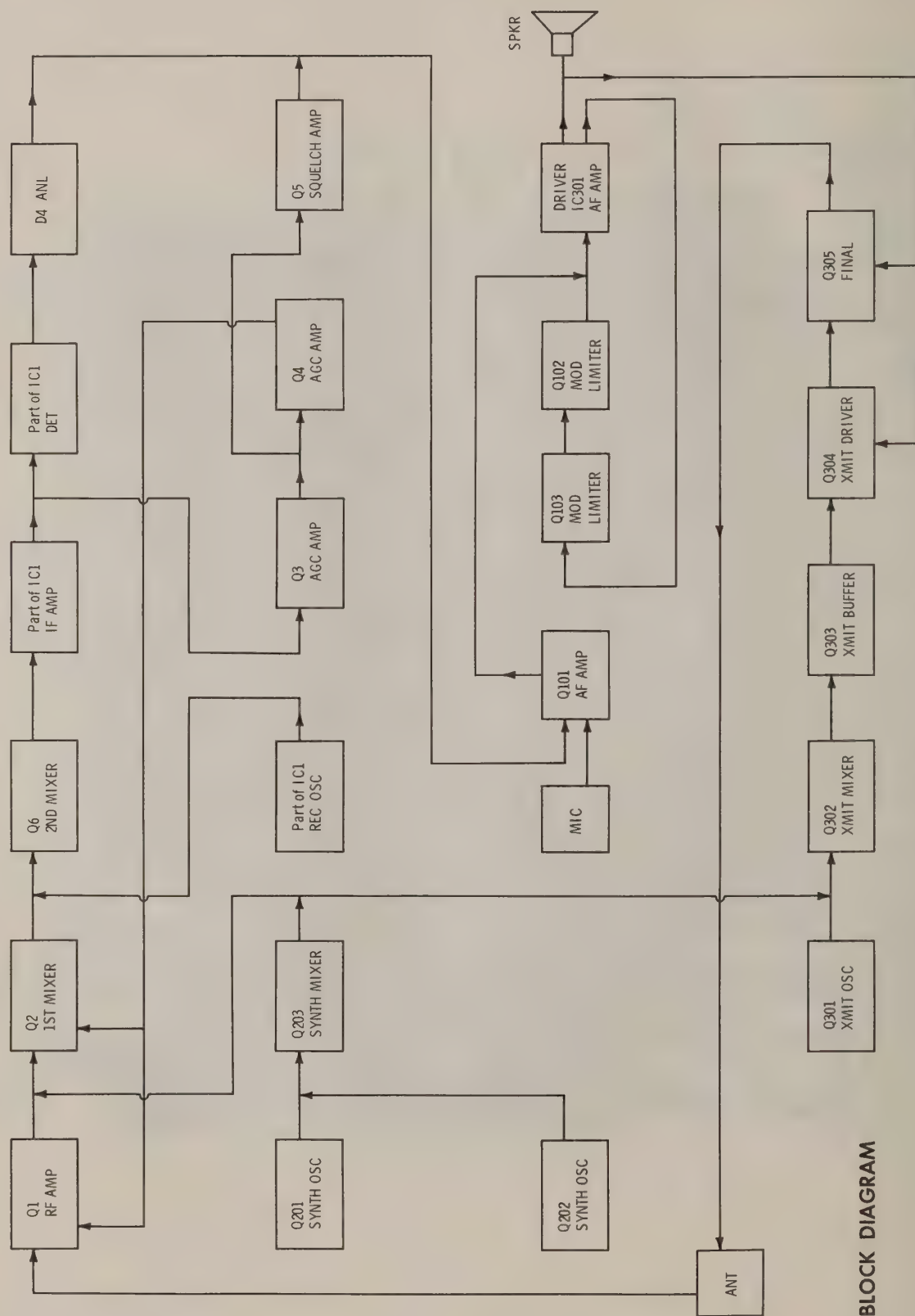
MAIN BOARD



MAIN BOARD



MAIN BOARD



PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1S2076	VHD1S2076-1	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D2	1S2076	VHD1S2076-1	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D3		VHEWZ-100-1F	GEZD-10		ZB10B		RE 115	SK3061	RT-241	ECG140
D4	1N60	VHD1N60-1	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
	1S2076	VHD1S2076-1	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
		(1)								
D5	1N60	VHD1N60-1	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D6	1N60	VHD1N60-1	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D7	1S2076	VHD1S2076-1	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D9	1N60	VHD1N60-1	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
	1S2076	VHD1S2076-1	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D101	1N60	VHD1N60-1	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D102	1S1885	VHD1S1885-1	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
IC-1	HAT1516F1	RH-1X1030AFZZ								
IC-301	TBA810S-H	RH-1X1020AFZZ								
Q1	2SC784R	VS2SC784R1F	GE-60 *	(IR)2SC380A	PTC132 *	HEPS0008 *	RE 89	SK3184	RT-187	ECG115
	2SC1675M	VS2SC1675M-1	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 28 *	SK3018 *	RT-308	ECG229 *
		(1)					RE 13 *	SK3124		ECG229 *
Q2	2SC394Y	VS2SC394Y-1	GE-61 *	(IR)2SC372	PTC121 *	HEPS0014 *	RE 9	SK3018 *	RT-309	ECG229 *
	2SC1675M	VS2SC1675M-1	GE-213	TR-33	PTC139 *	HEPS0025 *	RE 13 *	SK3124	RT-308	ECG229 *
		(1)								
Q3	2SC373	VS2SC373G-1	GE-212	(IR)2SC373	PTC121 *	HEPS0015 *	RE 192	SK3122	RT-105	ECG199
	2SC945L,K	VS2SC945L-K-1	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
		(1)								
Q4	2SC373	VS2SC373G-1	GE-212	(IR)2SC373	PTC121 *	HEPS0015 *	RE 192	SK3122	RT-105	ECG199
	2SC945L,P	VS2SC945L-P-1	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
		(1)								
Q5	2SC733BL	VS2SC733B-1	GE-62	(IR)2SC372	PTC139 *	HEPS0025 *	RE 192	SK3122	RT-302	ECG199
	2SC900U	VS2SC900U-1	GE-62	(IR)2SC644	PTC139 *	HEPS0015 *	RE 192	SK3124	RT-302	ECG199
		(1)								
Q6	2SC460B	VS2SC460B-1	GE-61 *	(IR)2SC460B	PTC136 *	HEPS0014 *	RE 9	SK3018 *	RT-134	ECG107
Q101	2SC945	VS2SC945	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
	2SC945L,P	VS2SC945L-P-1	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
		(1)								
Q102	2SC735Y	VS2SC735Y-1	GE-210 *	TR-21 *	PTC123 *	HEPS0014 *	RE 13 *	SK3122	RT-308 *	ECG289
	2SD227V	VS2SD227V-1	GE-81 *	TR-24 *	PTC123 *	HEPS0011 *	RE 13 *	SK3124	RT-172 *	ECG123A *
Q103	2SC373	VS2SC373G-1	GE-212	(IR)2SC373	PTC121 *	HEPS0015 *	RE 192	SK3122	RT-105	ECG199
	2SC945L,P	VS2SC945L-P-1	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
Q201	2SK49F	VS2SK49F-1	GE-FET-2	FE-100	PTC152	HEPF0021	RE 45	SK3116	RT-175	ECG132
Q202	2SK49F	VS2SK49F-1	GE-FET-2	FE-100	PTC152	HEPF0021	RE 45	SK3116	RT-175	ECG132
Q203	2SC394Y	VS2SC394Y-1	GE-61 *	(IR)2SC372	PTC121 *	HEPS0014 *	RE 9	SK3018 *	RT-309	ECG229 *
	2SC945LP	VS2SC945LP-1	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
		(1)								
Q301	2SK49	VS2SK49F-1(1)	GE-FET-2	FE-100	PTC152	HEPF0021	RE-45	SK3116	RT-175	ECG132
	2SK49F	VS2SK49F-1	GE-FET-2	FE-100	PTC152	HEPF0021	RE-45	SK3116	RT-175	ECG132
Q302	2SC735Y	VS2SC735Y-1	GE-210 *	TR-21 *	PTC123 *	HEPS0014 *	RE 13 *	SK3122	RT-308 *	ECG289
	2SC945LP	VS2SC945LP-1	GE-212	(IR)2SC945	PTC121 *	HEPS0015 *	RE 192	SK3124	RT-107A	ECG199
		(1)								
Q303	2SC1166Y	VS2SC1166Y-1	GE-81 *	TR-63 *	PTC143	HEPS5026 *	RE 210	SK3122	RT-141	ECG297
	2SC1166-0	VS2SC1166-0-1	GE-81 *	TR-63 *	PTC143	HEPS5026 *	RE 210	SK3122	RT-141	ECG297
		(1)								
Q304	2SC495T	VS2SC495T-1	GE-270	WEP913	PTC180		RE 209		RT-162	ECG295
		(11)								
Q305	2SC1237	VS2SC1237-1F	GE-215		PTC186		RE 203	SK3197	RT-191	ECG235
		(12)								

* Lead configuration may vary from original.

(1) Used in some versions.

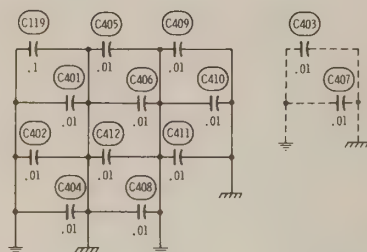
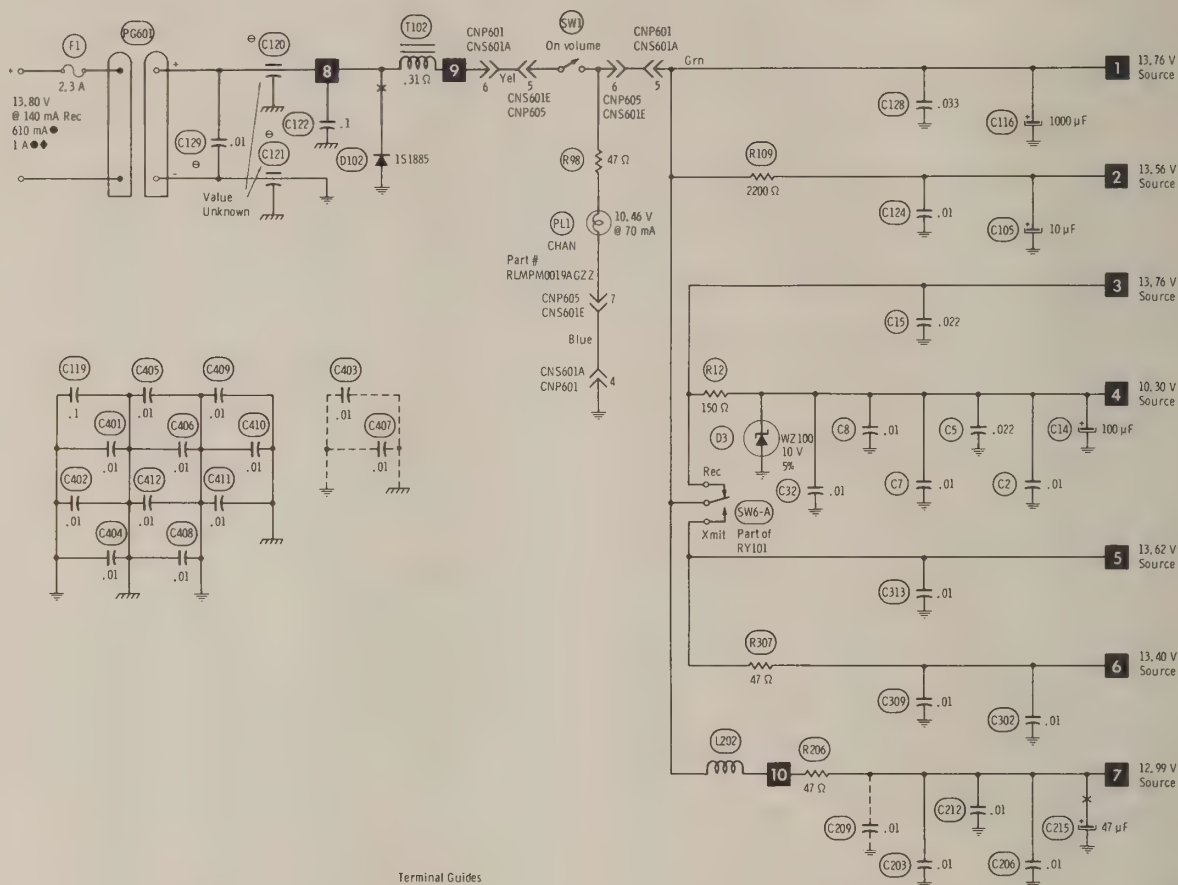
(11) Rating, 5 WATT @ 800ma.

(12) Rating, 10 WATT

ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C14	100 10V	VCEAAU1AW107Y	PC100-10	VTT100E10	QV1-93	EV-1130
C18	3.3 25V	VCEAAU1EW335Y	PC5-50	VTT3R3A50	QV1-23	EV-1318
C27	1 50V	VCEAAU1HW105Y	PC1-50	VTT1B63	QV1-11	EV-1615
C28	4.7 25V	VCEAAU1EW475Y	PC5-50	VTT4R7A50	QV1-27	EV-1319
C29	10 16V	VCEAAU1CW106Y	PC10-25	VTT10A25	QV1-41	EV-1222
C34	10 16V	VCEAAU1CW106Y	PC10-25	VTT10A25	QV1-41	EV-1222
C103	4.7 25V	VCEAAU1EW475Y	PC5-50	VTT4R7A50	QV1-27	EV-1319
C105	10 16V	VCEAAU1CW106Y	PC10-25	VTT10A25	QV1-41	EV-1222
C110	47 16V	VCEAAU1CW476Y	PC50-16	VTT10A25	QV1-41	EV-1222
C111	33 10V	VCEAAU1AW336Y	PC30-25	VTT47D16	QV1-73	EV-1226
C112	.1 50V	VCEALU1HW104M		VTT33A10	QV1-61	EV-1125
C113	47 16V	VCEAAU1CW476Y		TDC104M050EL	QDT1-2	SD50-R109
C114	.1 50V	VCEALU1HW104M	PC50-16	VTT47D16	QV1-73	EV-1226
C115	470 10V	VCEAAU1AW477Y		TDC104M050EL	QDT1-2	SD50-R109
C116	1000 16V	VCEAAU1CW108Y	PC500-16	VTT47QJ16	QV1-149	EV-1150
C117	3.3 25V	VCEAAU1EW335Y	PC1000-16	VTT100L16	QV1-183	EV-1260
C118	10 16V	VCEAAU1CW106Y	PC5-50	VTT3R3A50	QV1-23	EV-1318
C126	1 50V	VCEAAU1HW105Y	PC10-25	VTT10A25	QV1-41	EV-1222
C215	47 16V	VCEAAU1CW476Y	PC1-50	VTT1B63	QV1-11	EV-1615
			PC50-16	VTT47D16	QV1-73	EV-1226

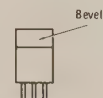
SHARP MODEL CB-700



Terminal Guides



Q1 thru Q5
Q102, Q103
Q203, Q302
Bottom view



Q6, Q303
Front view



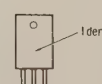
Q101
Bottom view



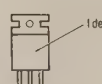
Q201
Bottom view



Q301
Bottom view



Q304
Front view



Q305
Front view



IC301
Front view



IC1
Front view

Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X1, X7	7	X2, X9	13	X4, X7	19	X5, X9
2	X1, X8	8	X2, X10	14	X4, X8	20	X5, X10
3	X1, X9	9	X3, X7	15	X4, X9	21	X6, X7
4	X1, X10	10	X3, X8	16	X4, X10	22	X6, X8
5	X2, X7	11	X3, X9	17	X5, X7		
6	X2, X8	12	X3, X10	18	X5, X8	23	X6, X10

— Circuitry not used in some versions

--- Circuitry used in some versions

⊙ See parts list

✱ Nominal value

⊕ Ground

⏏ Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ◆ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

Value in () used in some versions.

A PHOTOFAC STANDARD NOTATION SCHEMATIC

WITH CIRCUITRACE®

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PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C403	.01	(1)	CC-103	MGP01	TA110	QC2-141	TG-S10
C404	.01		CC-103	MGP01	TA110	QC2-141	TG-S10
C405	.01		CC-103	MGP01	TA110	QC2-141	TG-S10
C406	.01		CC-103	MGP01	TA110	QC2-141	TG-S10
C407	.01	(1)	CC-103	MGP01	TA110	QC2-141	TG-S10
C408	.01		CC-103	MGP01	TA110	QC2-141	TG-S10
C409	.01		CC-103	MGP01	TA110	QC2-141	TG-S10
C410	.01		CC-103	MGP01	TA110	QC2-141	TG-S10
C411	.01		CC-103	MGP01	TA110	QC2-141	TG-S10
C412	.01		CC-103	MGP01	TA110	QC2-141	TG-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

(1) Used in some versions.

(2) Nominal value replace with original value.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
R28	Squelch	10K	RVR-B0133AFZZ				
R101	Volume/Switch	5000	RVR-D0103AFZZ				
R112	AMC	1000	RVR-M0116AFZZ				

COILS (RF-IF)

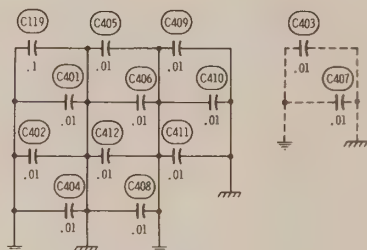
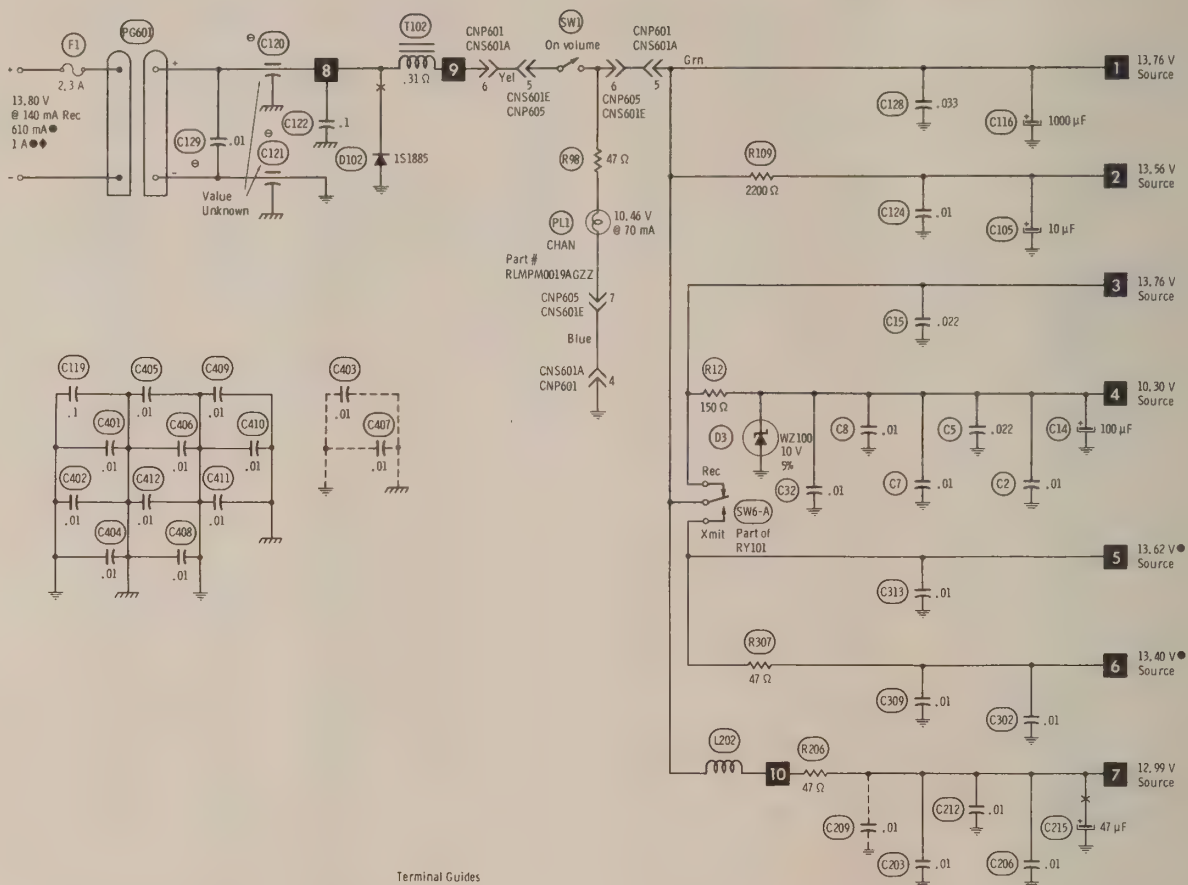
ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke	RCILZ0014AGZZ			
L101	RF Choke	RCILC0023AFZZ			
L201	Synth Osc (23MHz)	RCILA0377AFZZ			
L202	RF Choke	RCILC0024AFZZ			
L301	RF Choke	RCILC0011AFZZ			
L302	Final Amp (27MHz)	RCILR0135AFZZ			
L303	PI Filter (27MHz)	RCILR0055AFZZ			
L304	TVI Trap (81MHz)	RCILC0055AFZZ			
L305	TVI Trap (54MHz)	RCILC0055AFZZ			
T1	Rec Antenna (27MHz)	RCILA0377AFZZ	A03-77AF-6525		
T2	Rec RF (27MHz)	RCILR0304AFZZ	R03-04AF-651E		
T3	Rec Mixer (11MHz)	RCIL10210AFZZ			
T4	Rec Mixer (11MHz)	RCIL10210AFZZ			
T5	IF (455kHz)	RCIL10154AFZZ			
T6	Rec Osc (11MHz)	RCIL10210AFZZ			
T201	Synth Osc (15MHz)	RCILB0378AFZZ			
T202	Synth Mixer (37MHz)	RCIL10212AFZZ			
T301	Xmit Osc (11MHz)	RCILB0378AFZZ	B0-378		
T302	Xmit Mixer (27MHz)	RCIL10211AFZZ			
T303	Xmit Buffer (27MHz)	RCILB0221AFZZ			
T304	Xmit Driver (27MHz)	RCILR0037AFZZ			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T102	1A	.31	5.62mH	RTRNC0003AFZZ C0003AF (1)			(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T101	3.92	1 2 8 28.8	RTRNM0050AFZZ M0050AF (1)			(1) Number on unit.



Terminal Guides



Q1 thru Q5
Q102, Q103
Q203, Q302
Bottom view



Q6, Q303
Front view



Q101
Bottom view



Q201
Bottom view



Q301
Bottom view



Q304
Front view



Q305
Front view



IC301
Front view



IC1
Front view

— Circuitry not used in some versions

--- Circuitry used in some versions

⊙ See parts list

✱ Nominal value

⊥ Ground

Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ◆ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

Resistors are 1/2W or less, 5% unless noted.

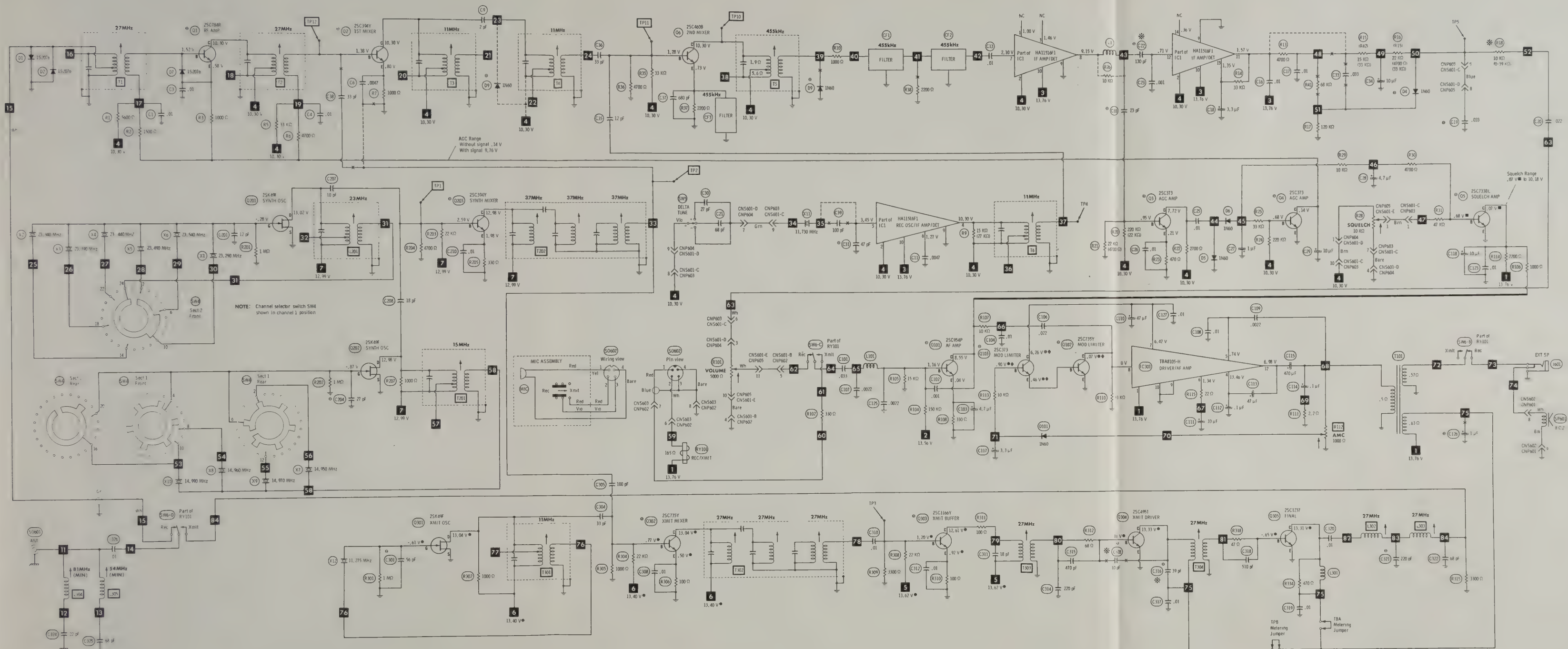
Value in () used in some versions.

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Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement	Chan	Crystal Complement
1	X1, X7	7	X2, X9	13	X4, X7	19	X5, X9
2	X1, X8	8	X2, X10	14	X4, X8	20	X5, X10
3	X1, X9	9	X3, X7	15	X4, X9	21	X6, X7
4	X1, X10	10	X3, X8	16	X4, X10	22	X6, X8
5	X2, X7	11	X3, X9	17	X5, X7		
6	X2, X8	12	X3, X10	18	X5, X8	23	X6, X10



PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP601	3" PM 8 Ohms	VSP0080P-208A	30A05Z8	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2.3A Fast Acting	QFS-A232AAFNA		AGC2-1/2	HDJ	31202.5	150145	

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA							
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black	
MIC	RMICD0206AFZZ	18-032	18-034	18-010	18-092	1	4	2	NC	NC	?	

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	23.290	RCRSB0009AFZZ	MA14W23290	1,2,3,4	X7	14.950	RCRSB0005AFZZ	MB32W14950	1,5,9,13,17,21
X2	23.340	RCRSB001DAFZZ	MA14W23340	5,6,7,8	X8	14.960	RCRSB0006AFZZ	MB32W14960	2,6,10,14,18,22
X3	23.390	RCRSB0011AFZZ	MA14W23390	9,10,11,12	X9	14.970	RCRSB0007AFZZ	MB32W14970	3,7,11,15,19
X4	23.440	RCRSB0012AFZZ	MA14W23440	13,14,15,16	X10	14.990	RCRSB0008AFZZ	MB32W14990	4,8,12,16,20,23
X5	23.490	RCRSB0013AFZZ	MA14W23490	17,18,19,20	X11	11.730	RCRSB0016AFZZ	MC32W11730	Rec. Osc.
X6	23.540	RCRSB0014AFZZ	MA14W23540	21,22,23	X12	11.275	RCRSB0015AFZZ	MC60W11275	Xmit Osc.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Filter	RFILA0050AFZZ or	455kHz
CF2	Filter	RFILA0052AFZZ	455kHz
CF3	Filter	RFILA0050AFZZ or	455kHz
RY101	Relay	RFILA0052AFZZ	455kHz
SW1	Switch	RFILA0001AFZZ	455kHz
SW4	Switch	RRLYZ0007AFZZ	Xmit/Rec (165 ohm)
SW5	Switch	QSW-R0127AFZZ	Part of Volume Control.
SW6	Switch	QSW-B0003AFZZ	Channel Selector
	Printed Circuit Board	QPWBF0485AFZZ	Delta Tune
	Printed Circuit Board	QPWBF0552AFZZ	Xmit/Rec Part of Relay (RY101).
	Printed Circuit Board	QPWBF0487AFZZ	Main
	Printed Circuit Board	QPWBF0542AFZZ	Main (F0552AF-A)
			Control (F0487AF)
			Sub

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Cabinet	GCAB-3016AFSA	Bracket, Mobile	LANGZ0003AFFW
Panel, Front	GWAKP1058AFSA	Knob, Channel Selector	JKNBNO302AFSA
Chassis, Main	LCHSM00237AFFW	Knob, Volume & Squelch	JKNBNO300AFSB
Chassis, Front	LCHSZ0050AFZZ	Knob, Delta Tune	JKNBMO219AFSB
Hanger, Microphone	PHAG-8001AFFC		

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors
	8524 (Stranded) Available in 13 Colors
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type)
	8237 Low-loss (RG-8/U)
	8240 (Solid) Miniature (RG-58/U)
	8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene



PHOTOFACT[®] with

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For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL MIC4512-47 (DC4512)

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:

T6, T7, T8 GC ELECTRONICS #8290, 5000

L3, T1, T3, T4, T5 GC ELECTRONICS #9440

RECEIVER ALIGNMENT

Connect an AC VTVM across speaker voice coil.

Set Squelch Control fully counterclockwise.

Adjust Volume Control for suitable reading.

SIGNAL GENERATOR	CHANNEL	ADJUST	REMARKS
Connect high side thru a .01 uF to collector of Q5, low side to ground. Set to 455 kHz (1000 Hz 30% Mod.)	Any	T8, T7, T6	Adjust for maximum.
Connect high side thru a .01 uF to antenna, low side to ground. Set to 27.085 MHz (1000 Hz 30% Mod.)	11	T4, T5	Adjust for maximum.
Connect high side thru a .01 uF to antenna, low side to ground. Set to 27.085 MHz (1000 Hz 30% Mod. 500 uV.)	11	VR3	Set Squelch Control fully clockwise. Adjust so squelch just breaks.

TRANSMITTER ALIGNMENT

INDICATOR	ADJUST	REMARKS
RF Wattmeter	T1, T3, L3	Connect wattmeter to antenna. Set to Ch. 11. Key transmitter. Adjust for maximum.
0-500 mA DC Milliammeter	T3	Insert meter between Ch-1 and R4. Adjust for no more than 5 watts.

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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4CX148R

TRUETONE MODEL MIC4512A-47

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA					
			CENTRAL LAB PART No.	CORNFILLER DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.		
						Q-LINE	GENERAL LINE	
C1	.01	(1)	DC-103	MGPO1	TA110	QC2-141	TG-S10	
C2	.01		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C3	.01		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C4	.01		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C5	.022		DC-203	MGPO2	TA120	QC2-157	TG-S20	
C6	.0047		DD-472	GP4700	GP247	5GA-047	TG-S10	
C7	.01		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C8	.01		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C9	2		DTZ-222	IP02P2	CN0522	10TCC-Q22	TG-S10	
C10	23 5% NPO 10 +1			DTZ-22	IP022	CN0422	10TCC-Q22	
C11	.0047		DTZ-10	NP010	CN0410	10TCC-Q10		
C13	.01		DD-472	GP4700	GP247	5GA-047		
C15	.022		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C16	.01		DC-203	MGPO2	TA120	QC2-157	TG-S20	
C17	.01		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C19	.033	(1)		WMF1S1	EMF1A110	QF1-91	1PB-S10	
	.015			M192P3339R3	M192P3339R3	M192P3339R3	192P3339R3	
C20	.022			M192P2239R8	M192P2239R8	M192P2239R8	192P2239R8	
C21	68			DD-680	GP68	GP468	QF1-127	
C22	130 5%		VCCSPU1HL131J					
	120 5%		(1)					
C23	.001			DTZ-120	CN0312	GP210	10TCC-T12	
C25	.01			DD-102	GP210	GP210	10TS-Q10	
C26	.01			DC-103	MGPO1	TA110	QC2-141	TG-S10
C30	27			DC-103	MGPO1	TA110	QC2-141	TG-S10
C31	.47		DTZ-47	NP047	CN0427	10TCC-Q27		
C32	.01		DTZ-47	NP047	CN0447	10TCC-Q47		
C33	.033		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C35	12			M192P3339R8	CN0412	192P3339R8		
C36	33 10% N075	VCCSPU1HL330J				10TCC-Q12		
C37	680		DD-681	GP680	GP368	10TS-T68		
C38	33 10% N075	VCCSPU1HL330J						
C39	100 5%		DTZ-100	NP0100	CN0310	10TCC-T10		
C101	.033				M192P3339R3	192P3339R3		
C102	.001			DPMS601	EMF1A210	1PB-D10		
C104	.01			WMF1S1	EMF1A110	QF1-91		
C106	.022				M192P2239R8	1PB-S22		
C107	.0022				M192P2239R8	192P2239R8		
C108	.01			WMF1S1	EMF1A110	1PB-S10		
C109	.0022				M192P2239R3	192P2239R8		
C119	.1		DC-104	MGPI	TA010	QC2-233		
C120		RC-KZ1006AFZZ						
C121		RC-KZ1006AFZZ						
C122	.1		DC-104	MGPI	TA010	QC2-233		
C123	.01		DC-103	MGPO1	TA110	QC2-141		
C124	.01		DC-103	MGPO1	TA110	TG-S10		
C125	.0022				M192P2229R3	192P2229R3		
C127	.01		DC-103	MGPO1	TA110	QC2-141		
C128	.033				M192P3339R8	192P3339R8		
C129	.01	(2)	DC-103	MGPO1	TA110	QC2-141		
C201	12				CN0412		10TCC-Q12	
C203	.01			DC-103	MGPO1	TA110	QC2-141	
C204	27 5%				CN0427		10TCC-Q27	
	18 5%		(1)			CN0418	10TCC-Q18	
C206	.01			DC-103	MGPO1	TA110	QC2-141	TG-S10
C207	100			DD-101	GP100	GP310	10TS-T10	10TCC-Q18
C208	18					CN0418		TG-S10
C210	.01			DC-103	MGPO1	TA110	QC2-141	TG-S10
C212	.01			DC-103	MGPO1	TA110	QC2-141	TG-S10
C301	56 5%			DD-560	GP456		10TS-Q56	
	68 5%	(1)		DTZ-68	NP068	CN0468	10TCC-Q68	
C302	.01			DC-103	MGPO1	TA110		TG-S10
C304	33 10% N075			VCCSPU1HL330J				
C305	100 5%			DTZ-100	NP0100	CN0310	10TCC-T10	
C308	.01			DC-103	MGPO1	TA110	QC2-141	
C309	.01			DC-103	MGPO1	TA110	QC2-141	
C310	.01			DC-103	MGPO1	TA110	TG-S10	
C311	18					CN0418	10TCC-Q18	
C312	.01			DC-103	MGPO1	TA110	QC2-141	
C313	.01			DC-103	MGPO1	TA110	QC2-141	
C314	220 10%	VCCSPU1HL471J VCCSPU1HL331J(1) VCCSPU1HL390J VCCSPU1HL220J(1)	DD-221	GP322		10TS-T22		
C315	470 5%							
	330 5%							
C316	39 5% N220				*		10TCR-Q39	
	22 5%				*		10TCR-Q22	
C317	.01			DC-103	MGPO1	TA110	TG-S10	
C318	510 5%		VCCSPU1HL511J					
C319	.01			DC-103	MGPO1	TA110	QC2-141	
C320	.01			DC-103	MGPO1	TA110	QC2-141	
C321	220 10%			DD-221	GP322		10TS-T22	
	180 5%	(1)	DD-181	GP318	GP318	10TS-T18		
C322	68		DD-680	GP68	GP468	10TS-Q68		
C324	22 5% NPO		DTZ-22	IP022	CN0422	10TCC-Q22		
C325	68		DD-680	GP68	GP468	10TS-Q68		
C326	.01		DC-103	MGPO1	TA110	QC2-141	TG-S10	
C328	10		DTZ-10	NP010	CN0410	10TCC-Q10		
C401	.01			DC-103	MGPO1	TA110	QC2-141	
C402	.01			DC-103	MGPO1	TA110	QC2-141	

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C403	.01	(1)	3C-103	MGPO1	TA110	QC2-141	TG-S10
C404	.01		3C-103	MGPO1	TA110	QC2-141	TG-S10
C405	.01		3C-103	MGPO1	TA110	QC2-141	TG-S10
C406	.01		3C-103	MGPO1	TA110	QC2-141	TG-S10
C407	.01	(1)	3C-103	MGPO1	TA110	QC2-141	TG-S10
C408	.01		3C-103	MGPO1	TA110	QC2-141	TG-S10
C409	.01		3C-103	MGPO1	TA110	QC2-141	TG-S10
C410	.01		3C-103	MGPO1	TA110	QC2-141	TG-S10
C411	.01		3C-103	MGPO1	TA110	QC2-141	TG-S10
C412	.01		3C-103	MGPO1	TA110	QC2-141	TG-S10

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

(1) Used in some versions.

(2) Nominal value replace with original value.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESIST-ANCE	REPLACEMENT DATA				
			MFG#. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
R28 R101 R112	Squelch Volume/Switch AHC	10K 5000 1000	RVR-B0133AFZ2 RVR-D0103AFZ2 RVR-M0116AFZ2				

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
L1	RF Choke	RC1LZ0014AGZZ			
L101	RF Choke	RC1LC0023AFZZ			
L201	Synth Osc (23MHz)	RC1LA0377AFZZ			
L202	RF Choke	RC1LC0024AFZZ			
L301	RF Choke	RC1LC0011AFZZ			
L302	Final Amp (27MHz)	RC1LR0135AFZZ			
L303	P1 Filter (27MHz)	RC1LR0055AFZZ			
L304	TVI Trap (91MHz)	RC1LC0055AFZZ			
L305	TVI Trap (54MHz)	RC1LC0055AFZZ			
T1	Rec Antenna (27MHz)	RC1LA0377AFZZ	A03-77AF-6525		
T2	Rec RF (27MHz)	RC1LR0304AFZZ	R03-04AF-651E		
T3	Rec Mixer (11MHz)	RC1L10210AFZZ			
T4	Rec Mixer (11MHz)	RC1L10210AFZZ			
T5	IF (455kHz)	RC1L10154AFZZ			
T6	Rec Osc (11MHz)	RC1L10210AFZZ			
T201	Synth Osc (15MHz)	RC1LB0378AFZZ			
T202	Synth Mixer (37MHz)	RC1L10212AFZZ			
T301	Xmit Osc (11MHz)	RC1LB0378AFZZ	B0-378		
T302	Xmit Mixer (27MHz)	RC1L10211AFZZ			
T303	Xmit Buffer (27MHz)	RC1LB0221AFZZ			
T304	Xmit Driver (27MHz)	RC1LR0037AFZZ			

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	CURRENT (Measured)	DC RES.	INDUCTANCE (0 CURRENT 1000~)	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T102	1A	.31	5.62mH	RTRNC0003AFZZ C0003AF (1)			(1) Number on unit.

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T101	3.92	1 2 8 28.8	RTRNM0050AFZZ M0050AF (1)			(1) Number on unit.

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFG. PART No.	QUAM PART No.	
SP601	3" PM 8 Ohms	VSP0080P-20BA	30A0528	

FUSE DEVICES

ITEM No.	DESCRIPTION	REPLACEMENT DATA						
		PART No.		BUSS PART No.		LITTELFUSE PART No.		WORKMAN PART No.
		DEVICE	HOLDER	DEVICE	HOLDER	DEVICE	HOLDER	DEVICE
F1	2.3A Fast Acting	QFS-A232AAFNA		AGC2-1/2	790	31202.5	150145	

MICROPHONE

ITEM No.	REPLACEMENT DATA				CONNECTION DATA						
	MFGR. PART No.	GC PART No.	GC NOISE CANCEL	GC POWER	GC CONNECTOR	GC Red	GC Shield	GC Yellow	GC Blue	GC White	GC Black
MIC	RMICD0206AFZZ	18-032	19-034	19-010	19-092	1	4	2	NC	NC	3

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X1	23.290	RCRSB0009AF ZZ	MA14W23290	1,2,3,4	X7	14.950	RCRSB0005AF ZZ	MB32W14950	1,5,9,13,17,21
X2	23.340	RCRSB0010AF ZZ	MA14W23340	5,6,7,8	X8	14.960	RCRSB0006AF ZZ	MB32W14960	2,6,10,14,18,22
X3	23.390	RCRSB0011AF ZZ	MA14W23390	9,10,11,12	X9	14.970	RCRSB0007AF ZZ	MB32W14970	3,7,11,15,19
X4	23.440	RCRSB0012AF ZZ	MA14W23440	13,14,15,16	X10	14.990	RCRSB0008AF ZZ	MB32W14990	4,8,12,16,20,23
X5	23.490	RCRSB0013AF ZZ	MA14W23490	17,18,19,20	X11	11.730	RCRSB0016AF ZZ	MC32W11730	Rec. Osc.
X6	23.540	RCRSB0014AF ZZ	MA14W23540	21,22,23	X12	11.275	RCRSB0015AF ZZ	MC60W11275	Xmit Osc.

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF1	Filter	RFILA0050AFZZ or	455kHz
CF2	Filter	RFILA0052AFZZ	455kHz
		RFILA0050AFZZ or	455kHz
		RFILA0052AFZZ	455kHz
CF3	Filter	RFILA0001AFZZ	455kHz
RY101	Relay	RRLYZ0007AFZZ	Xmit/Rec (165 ohm)
SW1	Switch		Part of Volume Control.
SW4	Switch	QSW-R0127AFZZ	Channel Selector
SW5	Switch	QSW-B0003AFZZ	Delta Tune
SW6	Switch		Xmit/Rec Part of Relay (RY101).
	Printed Circuit Board	QPWBF0485AFZZ	Main
	Printed Circuit Board	QPWBF0552AFZZ	Main (F0552AF-A)
	Printed Circuit Board	QPWBF0487AFZZ	Control (F0487AF)
	Printed Circuit Board	QPWBF0542AFZZ	Sub

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Cabinet	GCAB-3016AFSA	Bracket, Mobile	LANGZ0003AFFW
Panel, Front	GWAKP1058AFSA	Knob, Channel Selector	JCKNB0302AFSA
Chassis, Main	LCHSM00237AFFW	Knob, Volume & Squeich	JCKNB0300AFSA
Chassis, Front	LCHSZ0050AFZ2	Knob, Delta Tune	JCKNB00219AFSA
Hanger, Microphone	PHAG-8001AFFC		

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors 8524 (Stranded) Available in 13 Colors
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene



PHOTOFACT[®] with

CIRCUITRACE[®]

For Supplier Address See PHOTOFACT Index

NOTE

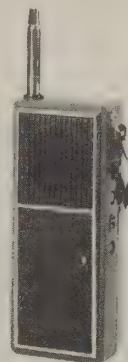
Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license.

(Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL MIC4512-47 (DC4512)

ALIGNMENT INSTRUCTIONS

Suggested Alignment Tools:

T6, T7, T8 GC ELECTRONICS #8290, 5000

L3, T1, T3, T4, T5 GC ELECTRONICS #9440

RECEIVER ALIGNMENT

Connect an AC VTVM across speaker voice coil.

Set Squelch Control fully counterclockwise.

Adjust Volume Control for suitable reading.

SIGNAL GENERATOR	CHANNEL	ADJUST	REMARKS
Connect high side thru a .01 uF to collector of Q5, low side to ground. Set to 455 kHz (1000 Hz 30% Mod.)	Any	T8, T7, T6	Adjust for maximum.
Connect high side thru a .01 uF to antenna, low side to ground. Set to 27.085 MHz (1000 Hz 30% Mod.)	11	T4, T5	Adjust for maximum.
Connect high side thru a .01 uF to antenna, low side to ground. Set to 27.085 MHz (1000 Hz 30% Mod. 500 uV.)	11	VR3	Set Squelch Control fully clockwise. Adjust so squelch just breaks.

TRANSMITTER ALIGNMENT

INDICATOR	ADJUST	REMARKS
RF Wattmeter	T1, T3, L3	Connect wattmeter to antenna. Set to Ch. 11. Key transmitter. Adjust for maximum.
0-500 mA DC Milliammeter	T3	Insert meter between Ch-1 and R4. Adjust for no more than 5 watts.

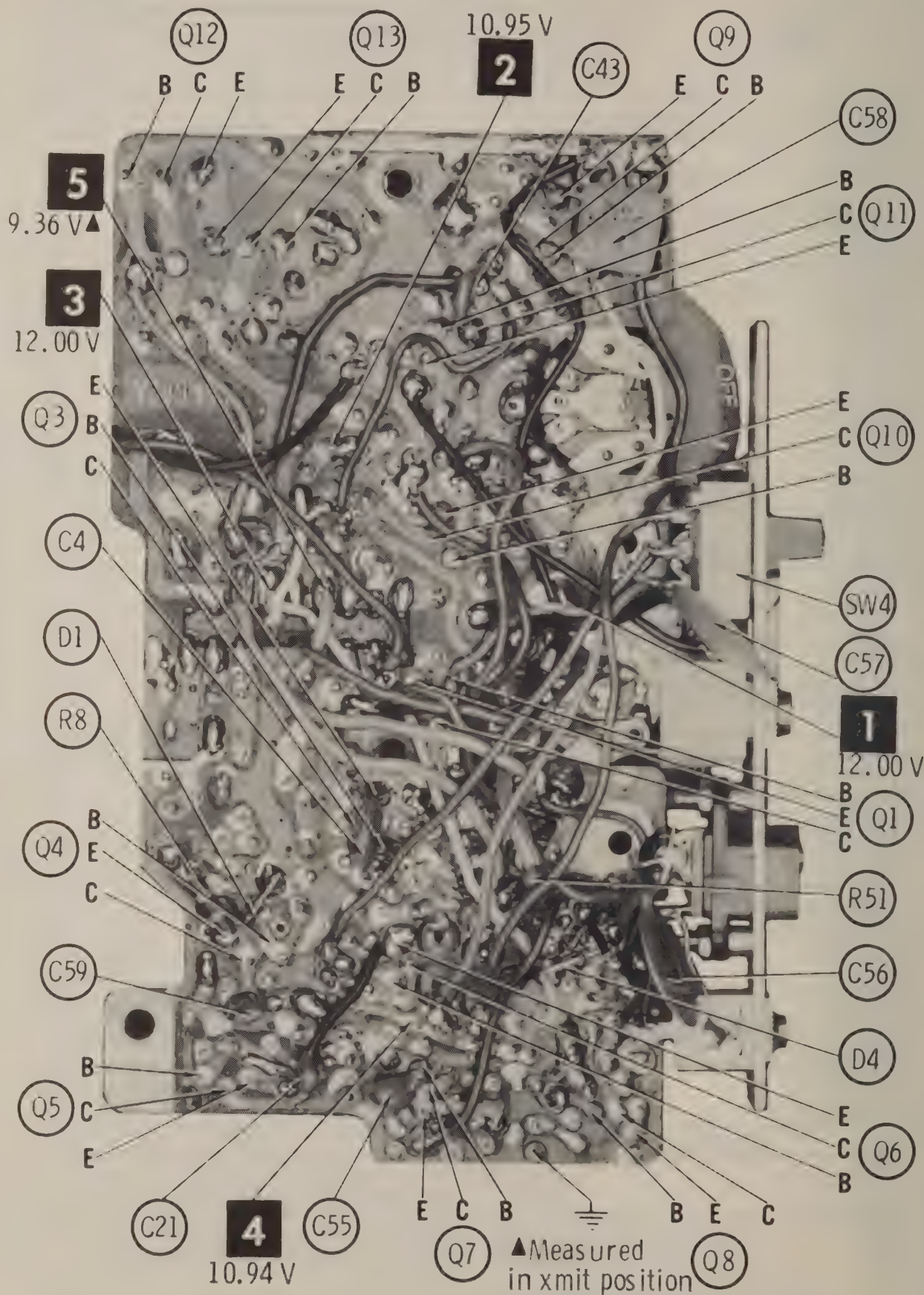
HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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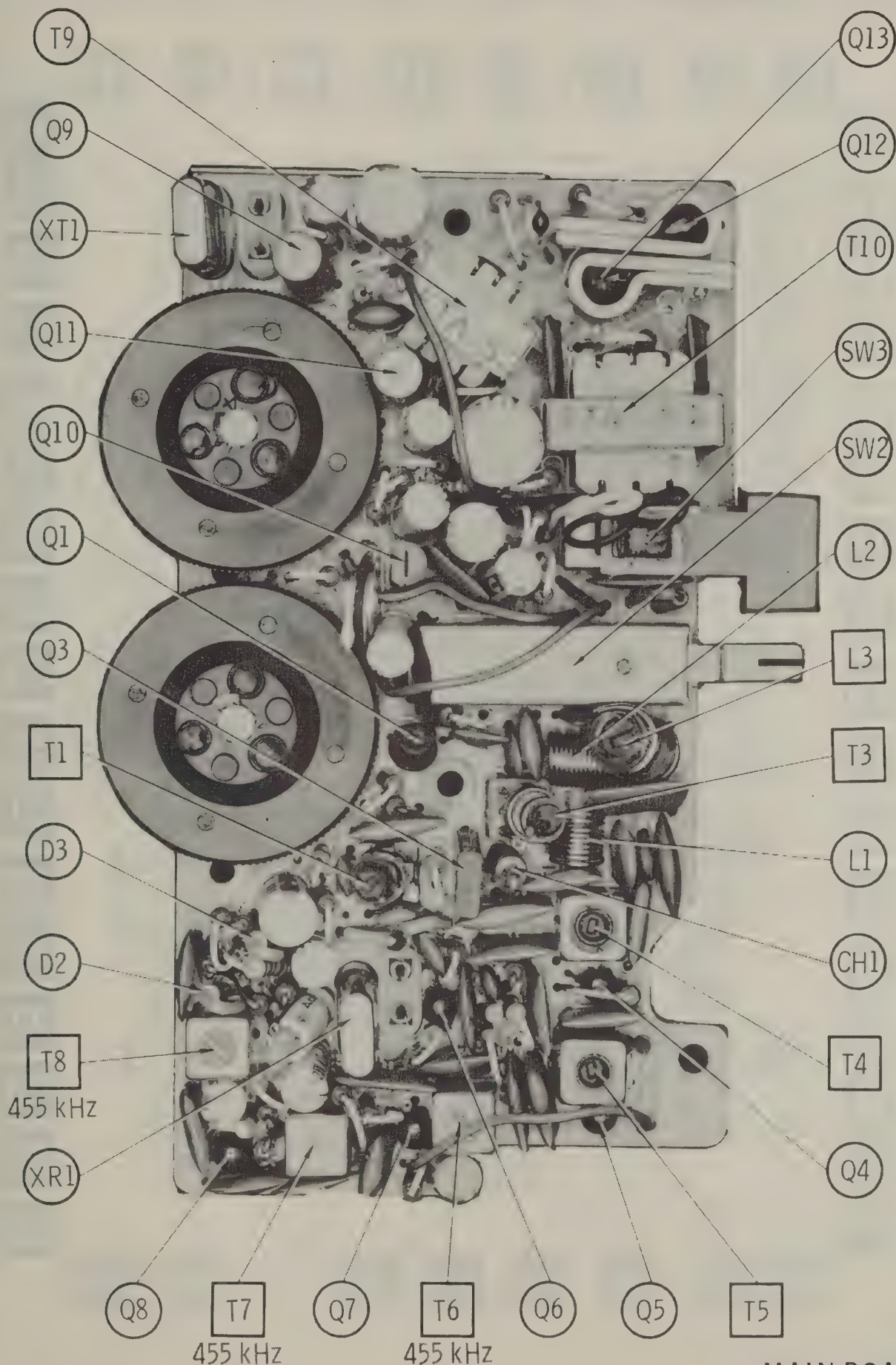
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TRUE-TONE MODEL MIC4512A-47



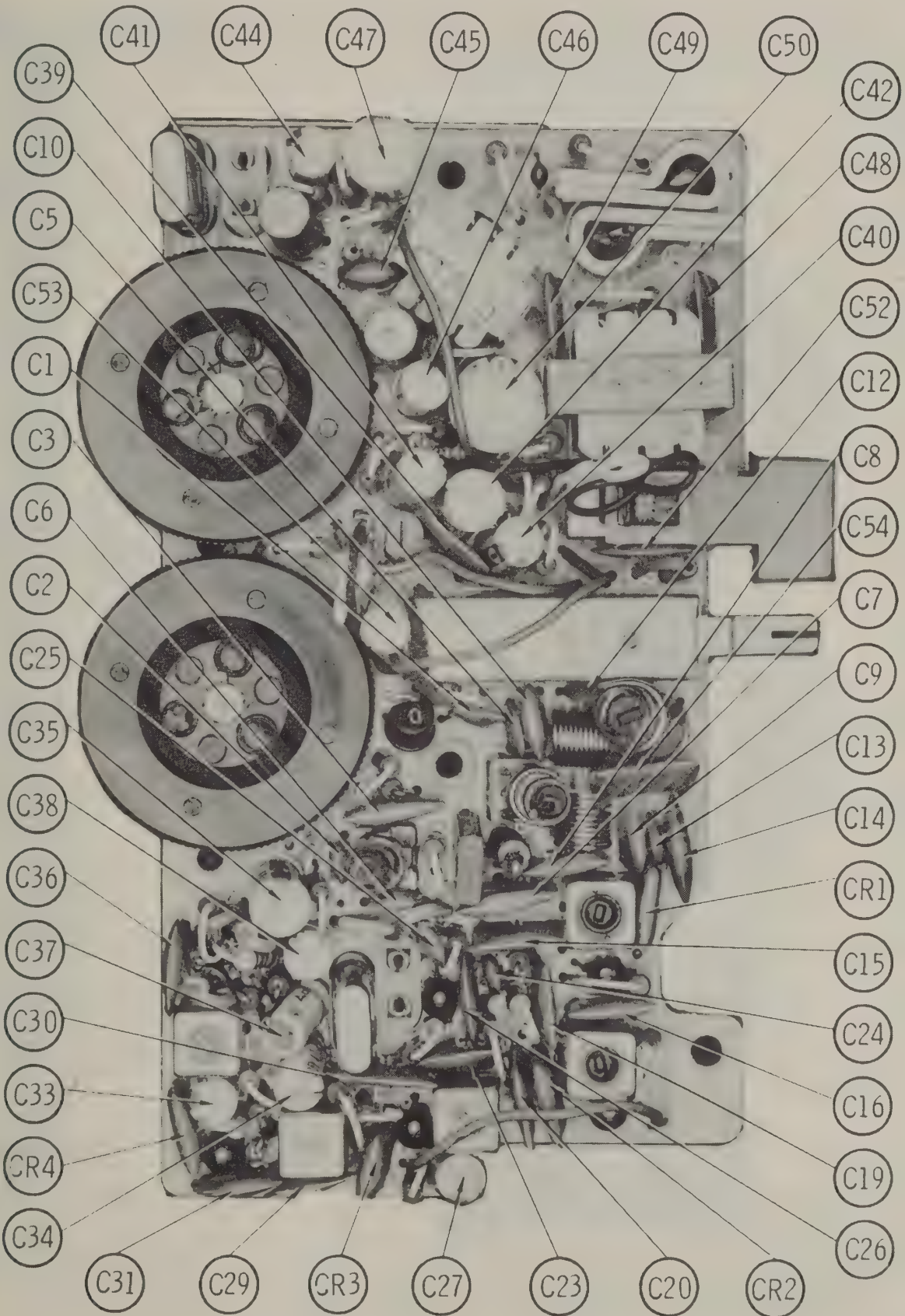
MAIN BOARD



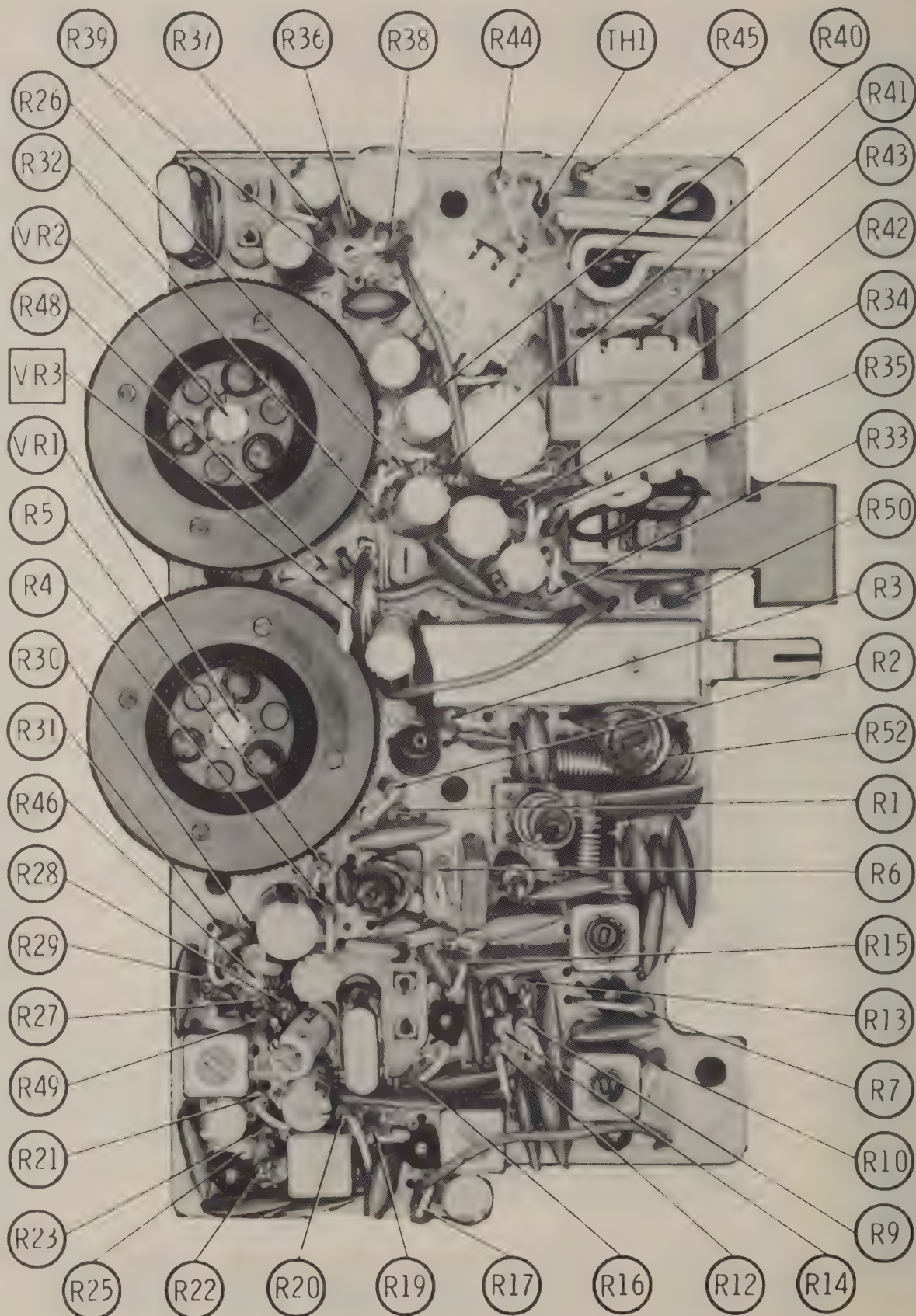
MAIN BOARD



MAIN BOARD



MAIN BOARD



MAIN BOARD

PARTS LIST AND DESCRIPTION

(When ordering parts, state Model, Part Number, and Description.)

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors
Shielded Antenna Lead	8524 (Stranded) Available in 13 Colors
Shielded Cable	Use BELDEN No. 8240 (Solid) Miniature (RG-58/U)
	8259 (Stranded) Miniature (RG-58A/U)
	Use BELDEN No. 8401 or 8421

SEMICONDUCTORS (Select replacement transistor for best results)

ITEM No.	TYPE No.	MFR. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1S1555	09-306145	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG177
D2	1N60	09-306019	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D3,4	1N60	09-306019	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
TH1		13-086028			PTC301					
Q1	2SC734	09-302090	GE-212	TR-87 *	PTC123 *	HEPS5026 *	RE 17 *	SK3122	RT-302	ECG128 *
Q3	2SC495T	09-302212	GE-336				RE 209		RT-162	ECG295
Q4	2SC930	09-302037	GE-60 *	(IR)2SC772	PTC132 *	HEPS0016 *	RE 9	SK3039 *	RT-308	ECG229 *
Q5	2SC930	09-302037	GE-60 *	(IR)2SC772	PTC132 *	HEPS0016 *	RE 9	SK3039 *	RT-308	ECG229 *
	2SC772	(1)	GE-61 *	(IR)2SC772	PTC132 *	HEPS0016 *	RE 9	SK3018 *	RT-187	ECG107
Q6	2SC930	09-302037	GE-60 *	(IR)2SC772	PTC132 *	HEPS0016 *	RE 9	SK3039 *	RT-308	ECG229 *
	2SC772	(1)	GE-61 *	(IR)2SC772	PTC132 *	HEPS0016 *	RE 9	SK3018 *	RT-187	ECG107
Q7	2SC536	09-302053	GE-212	(IR)2SC536	PTC121 *	HEPS0016 *	RE 192	SK3124	RT-107A	ECG199
Q8	2SC536	09-302053	GE-212	(IR)2SC536	PTC121 *	HEPS0016 *	RE 192	SK3124	RT-107A	ECG199
Q9	2SD187	09-303030	GE-53	(IR)2SB187	PTC135	HEPG0005	RE 4	SK3004	RT-123	ECG102A
Q10	2SC945	09-302125	GE-212	(IR)2SC945	PTC121 *	HEPS0016 *	RE 192	SK3124	RT-107A	ECG199
Q11	2SB187	09-301016	GE-53	(IR)2SB187	PTC135	HEPG0005	RE 4	SK3004	RT-123	ECG102A
Q12	2SD261,R	09-303019	GE-63 *	TR-25 *	PTC178	HEPS3024 *	RE 196 *	SK3137	RT-114 *	ECG192 *
Q13	2SD261,R	09-303019	GE-63 *	TR-25 *	PTC178	HEPS3024 *	RE 196 *	SK3137	RT-114 *	ECG192 *

* Lead Configuration may vary from original.

(1) Used in some versions.

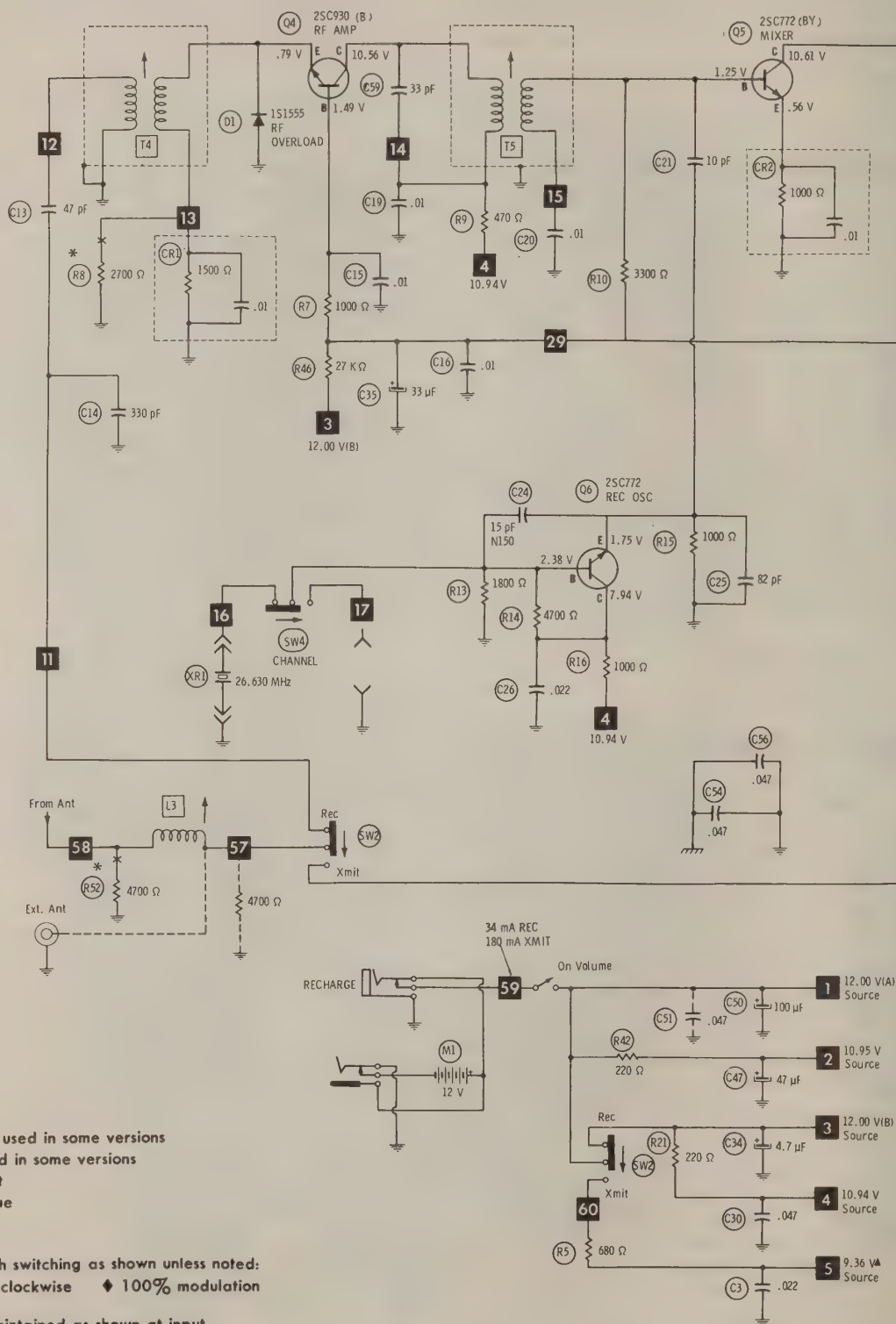
ELECTROLYTIC CAPACITORS

ITEM No.	RATING	REPLACEMENT DATA				
		MFR. PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
					Q-LINE	GENERAL LINE
C27	10 16V	77-337106	PC10-25	VTT10A25	QV1-41	EV-1222
C33	10 16V	77-337106	PC10-25	VTT10A25	QV1-41	EV-1222
C34	4.7 25V	77-339475	PC5-50	VTT4R7A50	QV1-27	EV-1319
C35	33 10V	77-336336	PC30-25	VTT33A10	QV1-61	EV-1125
C37	10 16V	77-337106	PC10-25	VTT10A25	QV1-41	EV-1222
C38	47 50V	77-333476	PC50-50	VTT47G63	QV1-79	EV-1626
C40	47 50V	77-333476	PC50-50	VTT47G63	QV1-79	EV-1626
C41	4.7 25V	77-339475	PC5-50	VTT4R7A50	QV1-27	EV-1319
C42	33 10V	77-336336	PC30-25	VTT33A10	QV1-61	EV-1125
C44	33 10V	77-336336	PC30-25	VTT33A10	QV1-61	EV-1125
C45	47 50V	77-333476	PC50-50	VTT47G63	QV1-79	EV-1626
C46	33 10V	77-336336	PC30-25	VTT33A10	QV1-61	EV-1125
C47	47 16V	77-337476	PC50-16	VTT47D16	QV1-73	EV-1226
C50	100 16V	77-337107	PC100-16	VTT100F16	QV1-95	EV-1230
C53	1 50V		PC1-50	VTT1B63	QV1-11	EV-1615

CAPACITORS

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C1	100		DD-101	GP100	GP310		10TS-T10
C2	15 N150				*		10TCP-Q15
C3	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C4	180		DD-181		GP318		10TS-T18
C5	56		DD-560		GP456		10TS-Q56
C6	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C7	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C8	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C9	82		DD-820		GP482		10TS-Q82
C10	150		DD-151		GP315		10TS-T15
C12	100		DD-101	GP100	GP310		10TS-T10

TRUE-TONE MODEL MIC4512A-47



* Circuitry not used in some versions
 --- Circuitry used in some versions
 ⊖ See parts list
 * Nominal value
 ⊕ Ground
 r/r Chassis
 Measurements with switching as shown unless noted:
 ■ Squelch fully clockwise ♦ 100% modulation
 ● Transmit
 Supply voltage maintained as shown at input.
 Voltages measured with digital meter, no signal.
 Controls adjusted for normal operation.
 Arrow at control indicates direction of advance.
 Terminal identification may not be found on unit.
 Resistors are 1/2W or less, 5% unless noted.
 Value in () used in some versions.

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WITH CIRCUITRACE

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PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C13	47		DTZ-47	NP047	CN0447		10TCC-Q47
C14	330		DD-331	GP330	GP333		10TS-T33
C15	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C16	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C19	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C20	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C21	10		DTZ-10	NP010	CN0410		10TCC-Q10
C23	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C24	15 N150				*		10TCP-Q15
C25	82		DD-820		GP482		10TS-Q82
C26	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C29	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C30	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C31	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C36	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C39	.0047		DD-472	GP4700	GP247		5GA-D47
C43	470		DD-471	GP470	GP347		10TS-T47
C45	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C48	.0047		DD-472	GP4700	GP247		5GA-D47
C49	.0047		DD-472	GP4700	GP247		5GA-D47
C51	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C52	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C54	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C55	2		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C56	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C57	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C58	.0047		DD-472	GP4700	GP247		5GA-D47
C59	33		DTZ-33	NP033	CN0433		10TCC-Q33

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	Volume/Switch	10K	13-160097	B16-214 (18)			
VR2	Squelch	10K	13-166051				
VR3	Squelch Range	10K		T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
	Squelch Range	100K	13-164087 (6)				

(2) Cut off one of the end terminals and bend to fit PC board.

(6) Alternate part, may be used in some versions.

(18) Use original knob.

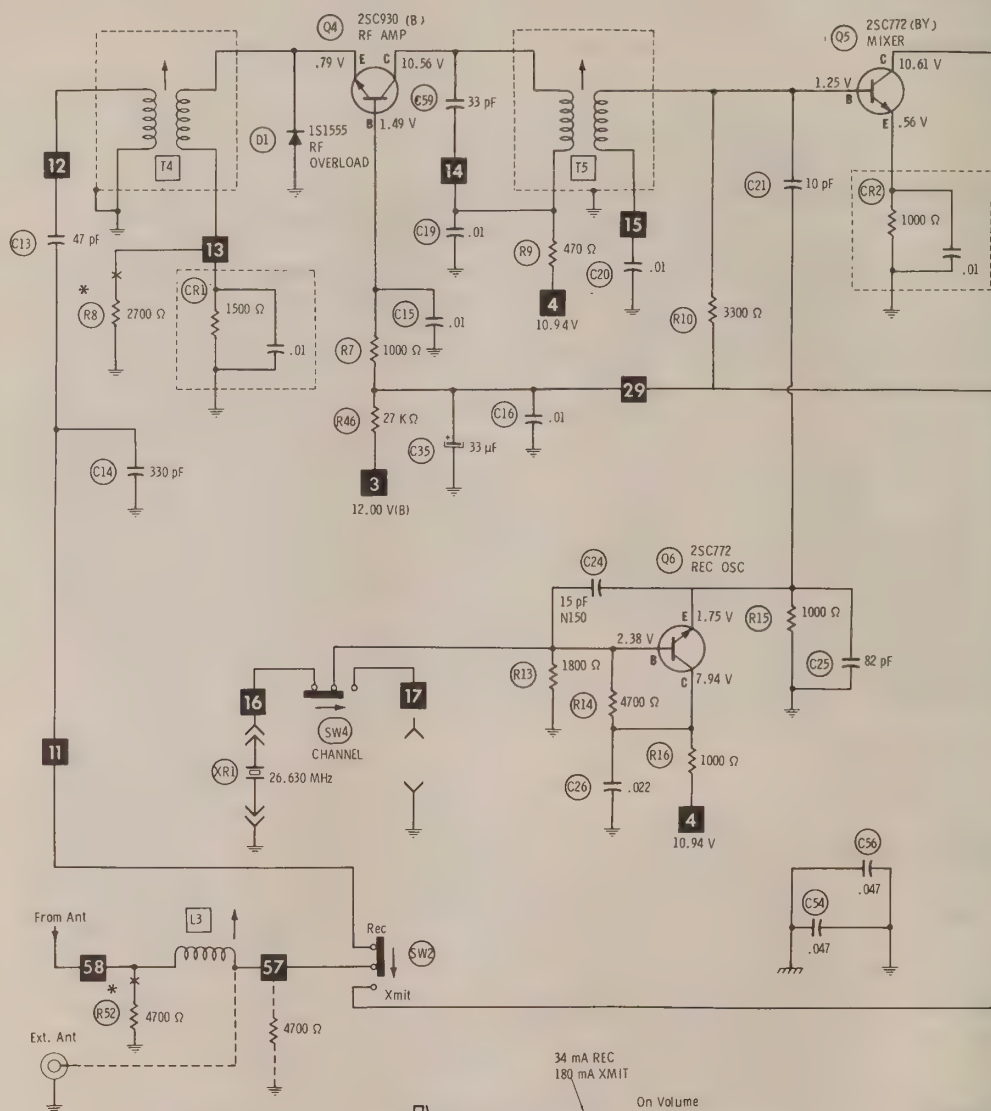
RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
R45	2.2 1/4 W Carbon			TH1	V.D.R. *		13-086028

* Voltage Dependent resistor.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
CH-1	RF Choke	13-178173			
L1	RF Choke	13-176397			
L2	RF Choke	13-178169			
L3	Antenna Match	13-176398			
T1	Xmit. Osc	13-170191			
T3	Final Amp	13-094138			
T4	Rec. Antenna	13-176399			
T5	Rec. RF	13-094140			
T6	IF (455kHz)	13-090286			
T7	IF (455kHz)	13-090287			
T8	IF (456kHz)	13-090288			



✱ Circuitry not used in some versions

--- Circuitry used in some versions

⊙ See parts list

✱ Nominal value

⊕ Ground

/// Chassis

Measurements with switching as shown unless noted:

■ Squelch fully clockwise ◆ 100% modulation

● Transmit

Supply voltage maintained as shown at input.

Voltages measured with digital meter, no signal.

Controls adjusted for normal operation.

Arrow at control indicates direction of advance.

Terminal identification may not be found on unit.

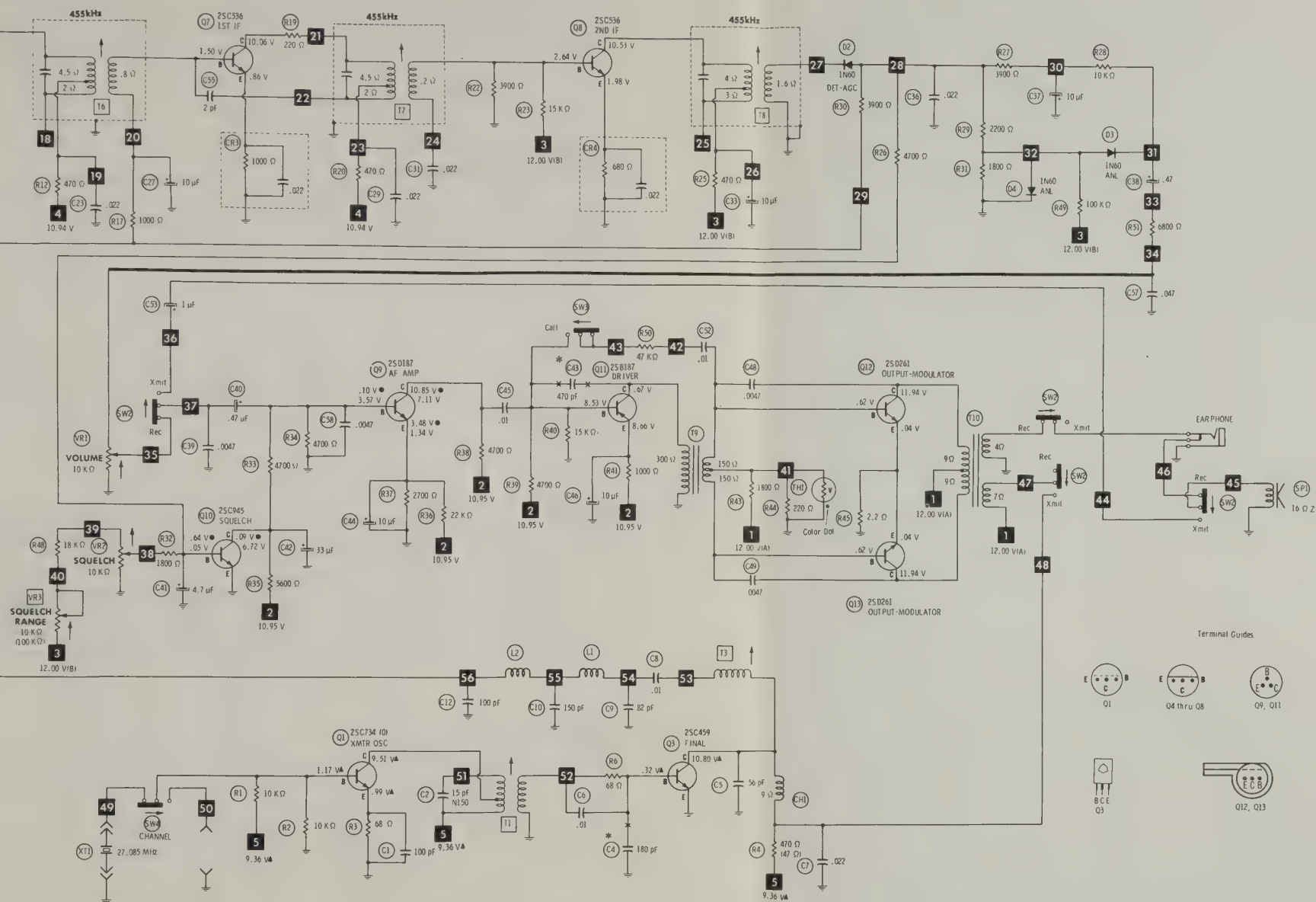
Resistors are 1/2W or less, 5% unless noted.

Value in () used in some versions.

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PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T9	1	1		13-096154 (ETA-52)			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
	PRI.	SEC.	MFGR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T10	256	16	13-096155			

SPEAKER

ITEM No.	TYPE	REPLACEMENT DATA		NOTES
		MFGR. PART No.	QUAM PART No.	
SP1	2" PM 16 Ohms	13-063001	2A05Z16	

CRYSTALS

CHANNEL	CTS KNIGHTS PART No.	
	RECEIVE	TRANSMIT
1	B20W26510	A20W26965
2	B20W26520	A20W26975
3	B20W26530	A20W26985
4	B20W26550	A20W27005
5	B20W26560	A20W27015
6	B20W26570	A20W27025
7	B20W26580	A20W27035
8	B20W26600	A20W27055

CHANNEL	CTS KNIGHTS PART No.	
	RECEIVE	TRANSMIT
9	B20W26610	A20W27065
10	B20W26620	A20W27075
*11	B20W26630	A20W27085
12	B20W26650	A20W27105
13	B20W26660	A20W27115
14	B20W26670	A20W27125
15	B20W26680	A20W27135
16	B20W26700	A20W27155

CHANNEL	CTS KNIGHTS PART No.	
	RECEIVE	TRANSMIT
17	B20W26710	A20W27165
18	B20W26720	A20W27175
19	B20W26730	A20W27185
20	B20W26750	A20W27205
21	B20W26760	A20W27215
22	B20W26770	A20W27225
23	B20W26800	A20W27255

* In Unit

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CR1	Component Combination	13-130009	Push-To-Talk Call Channel Selector Main
CR2	Component Combination	13-130008	
CR3	Component Combination	13-130010	
CR4	Component Combination	13-130011	
SW2	Switch	13-183174	
SW3	Switch	13-183168	
SW4	Switch	13-183175	
	Printed Circuit Board	13-070103	

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Panel, Front	13-010224	Knob, Call Signal	13-118084
Case, Front	13-010223	Knob, Vol./Squelch	13-110154
Case, Rear	13-013101	Antenna, Telescopic	13-040072
Knob, Push-To-Talk	13-118083	Strap, Hand	13-035061
Case, Leather Carrying	13-035062		

Listing all models/chassis covered in
PHOTOFACT CB (Citizens Band) Series volumes

AIRCRAFT	VOL.	BELTEK	VOL.	COBRA (CONT.)	VOL.	DEMCO (CONT.)	VOL.	FIELDMASTER (CONT.)	VOL.
JE321	15	Enduro 5 (W5396)	80	21X	108	Chalet, DMT-110	14	Micro Mini 23	56
23-02	38	Enduro 23(W5398)	105	21XLR	121	Ravelle	11	TR-18M	57
AIMOR				23, PAC-V	16	Ravelle 23	15	FULCOMM	
CB-7000	109	BENDIX		24	26	Satellite CB-1A	7	2301/02	90
AIRLINE		CB-6/-12	2	25	33	Satellite Deluxe	19	GEM MARINE	
GAS-587	4	BROWNING		27	43	Satellite M-10A, R-101A, T-110A, VW-12-120	7	GB-11935	91
ALARON		Brownie	80	28A	72	Travelier (Series B)	8	GR-11930	93
B-1025	105	Eaglette	20	29	56	DEWALD		GEMTRONICS	
B-1050	106	Eaglette 2	29	29XLR	123	TR-6/-12/910	2	GTX-23	90
B-1100	108	Golden Eagle Mark III	79	32XLR	125	DUO COM		GTX-36	93
B-1150(HA-23C)	107	LTD	66	85	77	100	2	GTX-2300	91
ALLIED		Mark II Series B, SSB-115	39	89XLR	124	DYNASCAN (See Cobra)		GTX-2325	82
A-2507 (17B6790X)	20	R-27, S-23	10	130	44	ECHO		GTX-3000	114
A-2530 (17B6825X)	19	SST	37	131	45	49ER	110	GENERAL ELECTRIC	
A-2533 (17B6440X)	22	SST (LP)		132A	73	99'er (Pg. 51)	49	Y7050A	16
A-2543 (17-9801S)	21	(Ser. No. T-50000 & up)	81	135 (EP & LP)	54	EICO		GENERAL RADIO & TELEPHONE	
A-2544 (17B9802S)	23	69R, 69T (Golden Eagle Mark II)	27	138/A	57	712	13	MC-6	7
A-2545 (17B9803S)	18	CADRE		139	59	740	4	Super MC-8	13
A-2559 (21B5559U)	34	C-75	11	880	47	760/61W/62/62W	2	Super MC-9	16
A-2561 (21B5561)	35	500/C	3	COMMANDO		770/W	3	Super MC-11/A	22
A-2564 (17A6966U)	29	510	4	2310	123	771W, 772W	4	VS-6, VS-7	11
A-2567 (17B6435X)	22	510A, 515	6	2320	119	777	7	GLOBE	
A-2568 (17A6965U)	29	525 (500-1, 520)	7	2325	119	779A	17	CB-100	1
A-2569 (17C6469U)	24			2340	121	7723	118	CB-100A	3
ALLSTATE				CONCORD		7923 (Nova 23)	18	CB-200	2
832.62270	7	CAPITOL		TG-132B	12	ELECTRONIC 2000		Globe Master 65-220 ..	6
893.62910/11/21/31/41. 6		ND-309	3	COURIER (E.C.I.)		Contact CB-23CH	56	X-90 (Pocketphone)....	1
AMERICAN ELECTRONICS				Cadet 23	46	ELECTROPHONIC (See Ross/Electrophonic)		65-228 (President VIII)	7
76-501 (Spirit)	95	CHANNEL MASTER		Caravelle	38	FANON		9000 (18-9000)	110
76-551 (Buccaneer) ...	96	6423	40	Caravelle II	73	CHB-3	35	9001 (18-9001)	119
76-601 (Freedom)	95	6553	9	CCT-2 W/CHB-3	35	CHB-4	37	GM	
AMPHENOL		6554	13	CCT-3	37	Fanfare 100	54	CBD-10	112
C-75	12	CITI-FONE		CCT-4	36	Fanfare 120	97	CBD-12	111
80	22	CD-5/6/-5/12.....	1	Centurion	52	Fanfare 700	53	GM23B	92
600, 625	11	CD-5A/6, CD-5A/12	9	Centurion Plus		Fanfare 880	73	GM123A	93
650	13	CD-6/6, CD-6/12	3	(Pg. 5)	52	FCB-9	4	GM130	95
675	14	CD11/6, CD11/12	12	Chief 23	35	IC-3000	24	GM130A	
725	15	II (1103-01)	15	Citation	34	IC-5000	25	(Sim. to Pg.47)	90
750	19	SS	9	Classic	25	L-1000	18	GM132	
777	18	19	26	Classic II	30	L-2000	17	(Sim. to Pg.5)	69
APELCO		99/6, 99/12	12	Classic III	67	SFT-400	35	994856	95
AR-9	1	CLARICON		Comet 23	48	SFT-500	35	995432	93
AR-10	7	14-523	27	Conqueror	38	SFT-600	31	789853	

PARTS LIST AND DESCRIPTION (CONTINUED)
(When ordering parts, state Model, Part Number, and Description.)

CAPACITORS (cont)

ITEM No.	RATING	MFR. PART No.	REPLACEMENT DATA				
			CENTRALAB PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	SPRAGUE PART No.	
						Q-LINE	GENERAL LINE
C13	47		DTZ-47	NP047	CN0447		10TCC-Q47
C14	330		DD-331	GP330	GP333		10TS-T33
C15	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C16	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C19	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C20	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C21	10		DTZ-10	NP010	CN0410		10TCC-Q10
C23	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C24	15 N150						10TCP-Q15
C25	82		DD-820		GP482		10TS-Q82
C26	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C29	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C30	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C31	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C36	.022		DC-203	MGP02	TA120	QC2-157	TG-S20
C39	.0047		DD-472	GP4700	GP247		56A-D47
C43	470		DD-471	GP470	GP347		10TS-T47
C45	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C48	.0047		DD-472	GP4700	GP247		56A-D47
C49	.0047		DD-472	GP4700	GP247		56A-D47
C51	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C52	.01		DC-103	MGP01	TA110	QC2-141	TG-S10
C54	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C55	2		DTZ-2R2	NP02P2	CN0522		10TCC-V22
C56	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C57	.047		DC-503	MGP05	TA150	QC2-207	TG-S50
C58	.0047		DD-472	GP4700	GP247		56A-D47
C59	33		DTZ-33	NP033	CN0433		10TCC-Q33

* Not normally in distributor's stock. Available thru distributor on order to manufacturer.

CONTROLS (All wattages 1/2 watt, or less, unless listed)

ITEM No.	FUNCTION	RESISTANCE	REPLACEMENT DATA				
			MFR. PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	MALLORY PART No.	TRW PART No.
VR1	Volume/Switch	10K	13-160097	B16-214 (18)			
VR2	Squelch	10K	13-166051				
VR3	Squelch Range	10K		T-10K (2)	C-103 (2)	MTC14L1 (2)	X201R103B (2)
	Squelch Range	100K	13-164087 (6)				

(2) Cut off one of the end terminals and bend to fit PC board.
(6) Alternate part, may be used in some versions.
(18) Use original knob.

RESISTORS (Power and Special)

ITEM No.	RATING	REPLACEMENT DATA		ITEM No.	RATING	REPLACEMENT DATA	
		WORKMAN PART No.	MFR. PART No.			WORKMAN PART No.	MFR. PART No.
R45	2.2 1/4 W Carbon			TH1	V.D.R. *		13-086028

* Voltage Dependent resistor.

COILS (RF-IF)

ITEM No.	FUNCTION	REPLACEMENT DATA			REMARKS
		PART No.	OTHER IDENTIFICATION	MILLER PART No.	
CH-1	RF Choke	13-178173			
L1	RF Choke	13-176397			
L2	RF Choke	13-178169			
L3	Antenna Match	13-176398			
T1	xmit. Osc	13-170191			
T3	Final Amp	13-094138			
T4	Rec. Antenna	13-176399			
T5	Rec. RF	13-094140			
T6	IF (455kHz)	13-090286			
T7	IF (455kHz)	13-090287			
T8	IF (456kHz)	13-090288			

PARTS LIST AND DESCRIPTION (CONTINUED)
(When ordering parts, state Model, Part Number, and Description.)

TRANSFORMER (Driver)

ITEM No.	TURNS RATIO			REPLACEMENT DATA			NOTES
	PRI.	SEC. 1	SEC. 2	MFR. PART No.	THORDARSON PART No.	TRIAD PART No.	
T9	1	1		13-096154 (ETA-52)			

TRANSFORMER (Audio Output)

ITEM No.	IMPEDANCE		REPLACEMENT DATA			NOTES
			MFG. PART No.	THORDARSON PART No.	TRIAD PART No.	
	PRI.	SEC.				
T10	256	16	13-096155			

SPEAKER

ITEM No.	TYPE		REPLACEMENT DATA		NOTES
			MFR. PART No.	QUAM PART No.	
SP1	2"	PM 16 Ohms	13-063001	2A05Z16	

CRYSTALS

CHANNEL	CTS KNIGHTS PART No.		CHANNEL	CTS KNIGHTS PART No.		CHANNEL	CTS KNIGHTS PART No.	
	RECEIVE	TRANSMIT		RECEIVE	TRANSMIT		RECEIVE	TRANSMIT
1	B20W26510	A20W26965	9	B20W26610	A20W27065	17	B20W26710	A20W27165
2	B20W26520	A20W26975	10	B20W26620	A20W27075	18	B20W26720	A20W27175
3	B20W26530	A20W26985	*11	B20W26630	A20W27085	19	B20W26730	A20W27185
4	B20W26550	A20W27005	12	B20W26650	A20W27105	20	B20W26750	A20W27205
5	B20W26560	A20W27015	13	B20W26660	A20W27115	21	B20W26760	A20W27215
6	B20W26570	A20W27025	14	B20W26670	A20W27125	22	B20W26770	A20W27225
7	B20W26580	A20W27035	15	B20W26680	A20W27135	23	B20W26800	A20W27255
8	B20W26600	A20W27055	16	B20W26700	A20W27155			

* In Unit

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CR1	Component Combination	13-130009	
CR2	Component Combination	13-130008	
CR3	Component Combination	13-130010	
CR4	Component Combination	13-130011	
SW2	Switch	13-183174	
SW3	Switch	13-183168	Push-To-Talk
SW4	Switch	13-183175	Call
	Printed Circuit Board	13-070103	Channel Selector
			Main

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

ITEM	PART No.	ITEM	PART No.
Panel, Front	13-010224	Knob, Call Signal	13-118084
Case, Front	13-010223	Knob, Vol./Squelch	13-110154
Case, Rear	13-013101	Antenna, Telescopic	13-040072
Knob, Push-To-Talk	13-118083	Strap, Hand	13-035061
Case, Leather Carrying	13-035062		

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Listing all models/chassis covered in
PHOTOFACT CB (Citizens Band) Series volumes

KEY → (EP) Early Production (LP) Late Production (Rev) Revised (SN) Serial Number (PCB) Production Change Bulletin

AIRCATTLE	VOL.	BELTEK	VOL.	COBRA (CONT.)	VOL.	DEMCO (CONT.)	VOL.	FIELDMASTER (CONT.)	VOL.
JE321	15	Enduro 5 (W5396)	80	21X	108	Chalet, DMT-110	14	Micro Mini 23	56
23-02	38	Enduro 23(W5398)	105	21XLR	121	Ravelle	11	TR-18M	57
AIMOR				23, PAC-V	16	Ravelle 23	15	FULCOMM	
CB-7000	109	BENDIX		24	26	Satellite CB-1A	7	2301/02	90
AIRLINE		CB-6/-12	2	25	33	Satellite Deluxe	19	GEM MARINE	
GAS-587	4	BROWNING		27	23	Satellite M-10A,		GB-11935	91
ALARON				28, PAC-24	43	R-101A, T-110A,		GR-11930	93
B-1025	105			28A	72	VW-12-120	7		
B-1050	106	Brownie	80	29	56	Travelier (Series B) .	8		
B-1100	108	Eaglette	20	29XLR	123				
B-1150 (HA-23C)	107	Eaglette 2	29	32XLR	125	DEWALD		GEMTRONICS	
ALLIED		Golden Eagle Mark III	79	85	77	TR-6/-12/910	2	GTX-23	90
A-2507 (17B6790X)	20	LTD	66	89XLR	124	DUO COM		GTX-36	93
A-2530 (17B6825X)	19	Mark II Series B,		98	23	100	2	GTX-2300	91
A-2533 (17B6440X)	22	SSB-115	39	130	44			GTX-2325	82
A-2543 (17-9801S)	21	R-27, S-23	10	131	45			GTX-3000	114
A-2544 (17B9802S)	23	SST	37	132 (EP & LP)	54	DYNASCAN		GENERAL ELECTRIC	
A-2545 (17B9803S)	18	SST (LP)		132A	73	(See Cobra)		Y7050A	16
A-2559 (21B5559U)	34	(Ser. No. T-50000		135 (EP & LP)	54	ECHO		GENERAL RADIO & TELEPHONE	
A-2561 (21B5561)	35	& up)	81	138/A	57	49ER	110	MC-6	7
A-2564 (17A6966U)	29	69R, 69T (Golden		139	59	99'er (Pg. 51)	49	Super MC-8	13
A-2567 (17B6435X)	22	Eagle Mark II)	27	880	47			Super MC-9	16
A-2568 (17A696SU)	29	CADRE		COMMANDO				Super MC-11/A	22
A-2569 (17C6469U)	24			2310	123			VS-6, VS-7	11
		G-75	11	2320	119	EICO		GLOBE	
		500/C	3	2325	119	712	13	CB-100	1
		510	4	2340	121	740	4	CB-100A	3
		510A, 515	6	CONCORD		760/61W/62/62W	2	CB-200	2
		525 (500-1, 520)	7	TG-132B	12	770/W	3	Globe Master 65-220	6
				COURIER (E.C.I.)		771W, 772W	4	X-90 (Pocketphone)....	1
ALLSTATE		CAPITOL		Cadet 23	46	777	7	65-228	
832.62270	7			Caravelle	38	779A	17	(President VIII)	7
893.62910/11/21/31/41.	6	ND-309	3	Caravelle II	73	7723	118	9000 (18-9000)	110
AMERICAN ELECTRONICS				CCT-2 W/CHB-3	35	7923 (Nova 23)	18	9001 (18-9001)	119
76-501 (Spirit)	95	CHANNEL MASTER		CCT-3	37				
76-551 (Buccaneer)	96			CCT-4	36	ELECTRONIC 2000		GM	
76-601 (Freedom)	95	6423	40	Centurion	52	Contact CB-23CH	56	CBD-10	112
AMPHENOL		6553	9	Centurion Plus				CBD-12	111
C-75	12	6554	13	(Pg. 5)	52	ELECTROPHONIC		GM23B	92
80	22	CITI-FONE		Chief 23	35	(See Ross/Electroponic)		GM123A	93
600, 625	11			Citation	34			GM130	95
650	13	CD-5/6/-5/12	1	Classic	25	FANON		GM130A	
675	14	CD-5A/6, CD-5A/12	9	Classic II	30	CHB-3	35	(Sim. to Pg.47)	90
725	15	CD-6/6, CD-6/12	3	Classic III	67	CHB-4	37	GM132	
750	19	CD11/6, CD11/12	12	Comet 23	48	Fanfare 100	54	(Sim. to Pg.5)	69
777	18	II (1103-01)	15	Conqueror	38	Fanfare 120	97	994856	95
APELCO		SS	9	Conqueror II	73	Fanfare 700	53	995432	93
AR-9	1	19	26	Courier Clipper 23	26	Fanfare 880	73	7898530	112
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ARKAY				Courier TR-5	16	IC-3000	24	GONSET	
SQ-9/-9W	2			Courier TR-23S	13	IC-5000	25	G-11-3303/04/-05,	
				Courier 1M, 23	8	L-1000	18	G-12 (3316), (3329) .	1
				Courier 23 Plus	18	L-2000	17	G-14 (3430), (3433) ..	3
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20Y55-19 (1.45601)	29	14-523	27	CWT-40	27	SFT-600	31	1125	124
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MCB-500	97	15-410	14	Fleet Courier, 30-B .	9	SFT-900		GRANADA	
MCB-1000	99	15-500	23	Gladiator	49	(Guardsman)	37	CB-6	107
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		30200 (Intruder)	110	(Pg. 21)	49	T-606	41	FCB-27	113
		30400 (Pirate)	79	Ranger 23	33	T-700	93		
		30500 (Raider)	117	Rebel - 23+	54	T-707	43	BC-8	10
		30600 (Privateer)	85	Redball	72	T-800	101	CB-1	1
		30800 (Activator)	119	Spartan Plus		T-808	38	CB-3	3
				(Pg. 5)	56	T-909	40	CB-3A	5
		CLARION		Spartan SSB	56	T-1000	45		
		JC-201E (PE-620E)	118	Traveller (ML-100) ..	24				
		JC-201E (RE-366E)	117	Traveller II	31	FIELDMASTER			
		PE-620E	118			MF-1001	60		
		RE-366E	117	CRAIG		Micro Mini 3	55		
						Micro Mini 6	58		
		COBRA		4101	97				
		CAM-88	9	4102	100				
		CAM-89	58	4103	98				
		V	13	4104	105				
		6	34	4201	99				
		19	75						
		19M(Sim.to Pg.5)	75	DEMCO					
		20	49	CH-300	11				
		21	51						

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CB-4 (Littlefone) 3	981-6235 (981-0607)....100	KN-2500 (90SU413) 7	HE-20TA (99-32724WX) . 61	13-779 111
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CB-21 20	JOHNSON		(99-32559W) 52	13-855 44
CB-24 22		KRACO	Telsat SSB-50	13-856 46
PS-20 20	Messenger II (242-162/		(99-32666W) 50	13-857 90
	-163, 250-180/-811) . 5	KCB-2310A 106	Telsat SSB-50A	13-862 58
HALLMARK	Messenger III 8	KCB-2330B 116	(99-32849W) 66	13-862B 68
512 5	Messenger III	KCB-2370 113	Telsat SSB-75	13-863 71
1250B 10	(242-143) (Rev.) 30		(99-33052W) 96	13-864 60
	Messenger 100 12	KRIS	Telsat SSB-100	13-866 66
	Messenger 102		(99-33060W) 114	13-867 55
	(242-102) 32	T-23 (516-123) 47	Telsat 23 (99-3157WX) 25	13-868 37
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	(242-108) 50	Vega (516-139) 64	Telsat 150 (99-3215WX) 26	13-870C 27
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	(242-109) 26	Victor (416-123) 87	Telsat 925 (99-32856W) 62	13-871 50
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23 105	(242-0120) 41	23+ (516-023) 45	LA SALLE	13-877 30
43C 100	Messenger 120A	99'er 49		13-878 54
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235 109	Messenger 121		LA-101-AN 7	13-879B 66
305 110	(242-0121) 40	Com-Phone Mark II		13-880B 39
605 124	Messenger 121A	(99-33078W) 94	LINCOLN	13-881 63
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GW-31, GWW-31 4	(242-125) 28	(99-31940L) 37	MCB-9 4	TG-1 4
GW-32A, GWW-32A/D, .. 6	Messenger 130	Dyna-Com 3B		
GW-42, GWW-42 6	(242-0130) 63	(99-32450L) 46	METROTEK	MORROW
MW-34, MWW-34 8	Messenger 130A	Dyna-Com 5 (99-3087L) . 16		
	(242-0130A) 90	Dyna-Com 5a (99-32096L) 35	Bronco (CB-280) 21	CB-1/-2/-3 1
HITACHI	Messenger 132 69	Dyna-Com 6 19	Charger (CB-281) 22	VP-100-4A 2
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CM-2400C/H 115	(242-223) 23	Dyna-Com 12a (99-32484) 38	Mustang, Pacer 9	-12/-117 1
	Messenger 250	Dyna-Com 23 (99-32567L) 41	Pacer II 13	
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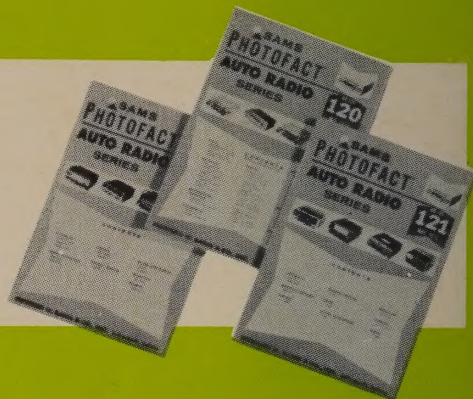
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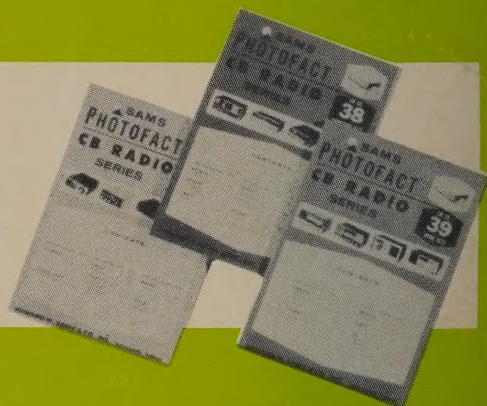
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